

The background image shows a modern building with a glass facade. In the upper right, a man and a woman in business attire are standing on a balcony, looking at a tablet. In the lower left, there is a large, lush green indoor plant. The Siemens logo is in the top left corner.

SIEMENS

Desigo building automation system

System Description

Answers for infrastructure and cities.



Desigo creates true added value for your building

Buildings not only offer space for working and living, they are also capital investments. Their value can be maintained only if they are operated cost-effectively. Currently, buildings account for 40 percent of the energy consumed worldwide. You can minimize this cost factor by using a state-of-the-art building automation system.

The Desigo™ building automation system allows you to achieve significant energy savings by efficiently linking, controlling and monitoring a variety of different functions and building disciplines. This results in a healthy room climate and higher user satisfaction. In addition, efficient energy saving features lower ever-increasing operating costs. Investments in this future-oriented technology pay off quickly. Another benefit are lower CO₂ emissions, which gives your company a "green" image. A true added value for you and your building.

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Desigo – the energy-efficient and flexible building automation and control system

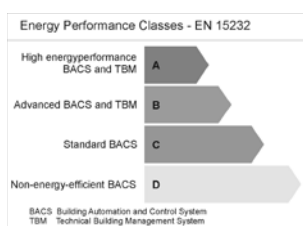
Desigo™ is a modern building automation and control system (BACS) for the entire field of building systems. With system functions such as alarm management, time scheduling and trend logging, combined with advanced control functions, Desigo is a highly versatile asset in a building. Innovative Web technology, powerful databases and open communication make Desigo a financially wise investment in the future. Scalable from small to large projects with the highest degree of energy efficiency, transparency and optimum operational management as well as applications for infrastructure and industry.

Desigo is consistent in its support of open communication, making it easy to connect a wide variety of building services systems on the basis of standard open data interfaces:

- BACnet™ from room automation to the management level
- KNX®, DALI, EnOcean® and LONWORKS® to network room automation and secondary processes
- M-bus, Modbus, OPC, MS/TP and other interfaces for universal connection of third-party devices and systems
- Ethernet TCP/IP network protocol

Highest degree of energy efficiency

The tested Desigo plant applications comply with European standard EN 15232 in the highest energy performance classes. Their use, for example, can reduce energy costs for volume flow control of ventilation plants up to 30% compared to constant air volume control. In addition, a number of Desigo room applications are already eu.bac-certified.



The high level of overall Desigo system functionality is the prerequisite for eu.bac system certification. Also, a number of Desigo room automation products have eu.bac product certification. The combination of both certifications ensures the highest level of energy efficiency in the building.

Desigo offers monitoring functions for room users and facility managers by means of comprehensive indication of the efficiency status in a building. The Green Leaf symbol indicates unnecessary energy consumption in the building to room users. Indication of building efficiency is indicated in the same way to facility managers on the Desigo Insight management station. Both room users and facility managers can ensure interactively the highest possible building efficiency.



Investment protection over the building's entire life-cycle

With its flexible range of automation stations and operator units, Desigo is ideally suited for projects of all sizes and for all types of buildings.

Consistent compatibility protects investment over decades and throughout the entire building life-cycle. Desigo integrates existing automation systems Visonik, Unigyr or Integral seamlessly and carries them forward into the future. Changes in use, system extension and retrofit projects can all be handled in gradual stages.

Designo system topology

The Designo system can be subdivided into two levels:

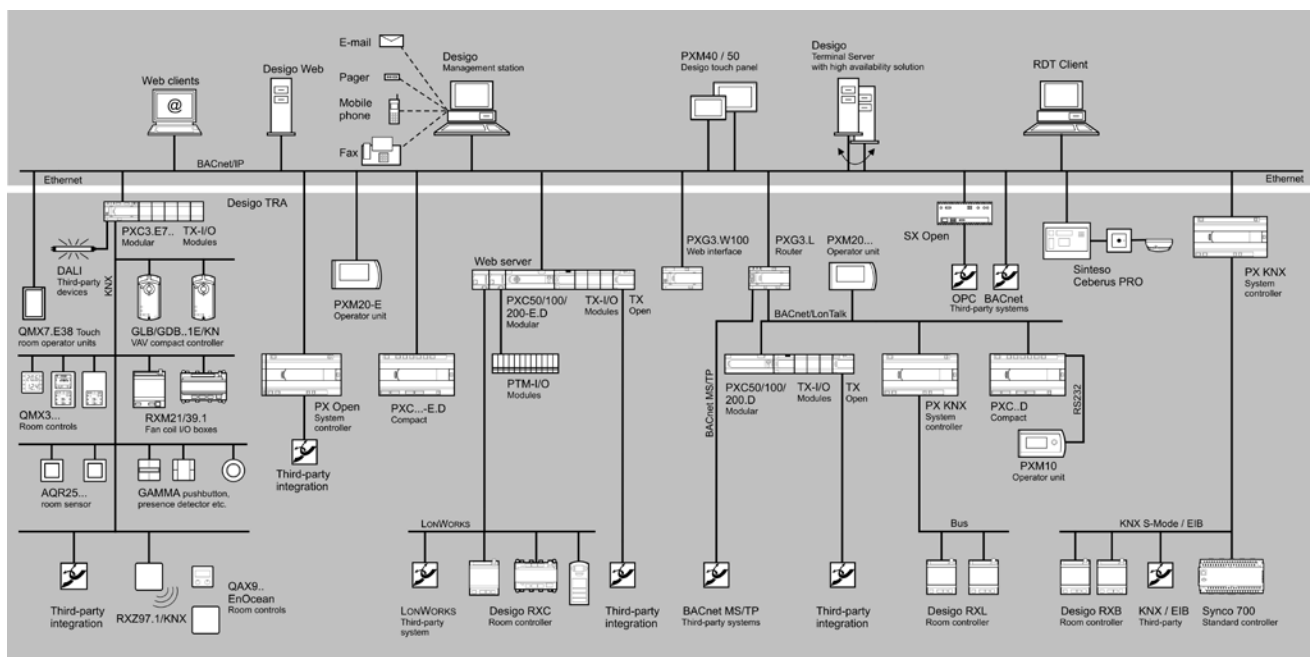
Management level

Automation level

The automation level forms the interface to the field level and includes room automation as well. By virtue of distributed intelligence, each of these levels operates both autonomously and in a network.

The principal Designo system components:

- Designo Insight management station for superimposed operation and monitoring, graphics-based display of the process, automatic alarm distribution and a wide range of different data analysis options using standardized protocols
- Designo PX automation range for control, operation and monitoring of primary plants. Designo Touch and Web can operate the plant via touch panel or Web client
- Designo TX-I/O modules, which provide the interface to the devices at the field level, the sensors and actuators
- Designo Total Room Automation (TRA) is an open and programmable room automation product range covering lighting, shading, and HVAC and allowing for individually tailored room solutions at a high level of energy efficiency
- Compact and proven Designo room automation system RX for autonomous comfort control in individual rooms
- Designo Open for the integration of a wide variety of plants and protocols at all system levels



Designo system topology

One of the key benefits of Designo is its scope for gradual extensions, from the smallest systems to large, geographically distributed systems. Scalability is illustrated using example topologies in chapter "System topologies".

System functions

Facility managers and room users of the Desigo system have a versatile range of tools at their disposal, offering convenient access to the system and the plant.

Operation and monitoring

Operator station

- The Desigo Insight management station is a powerful and user-friendly interface for monitoring the overall system. Access and alarm management can be matched to the user's level of responsibility in the building. For example, alarms can be assigned based on the user. Desigo Web and Desigo Terminal Server allow access to the management level using Web technology
- Desigo Touch and Web operate and monitor the Desigo PX automation level using a standard Web browser (HTML5 technology) on various hardware platforms (e.g. tablets, notebooks/PCs, smartphones)

Room operator unit

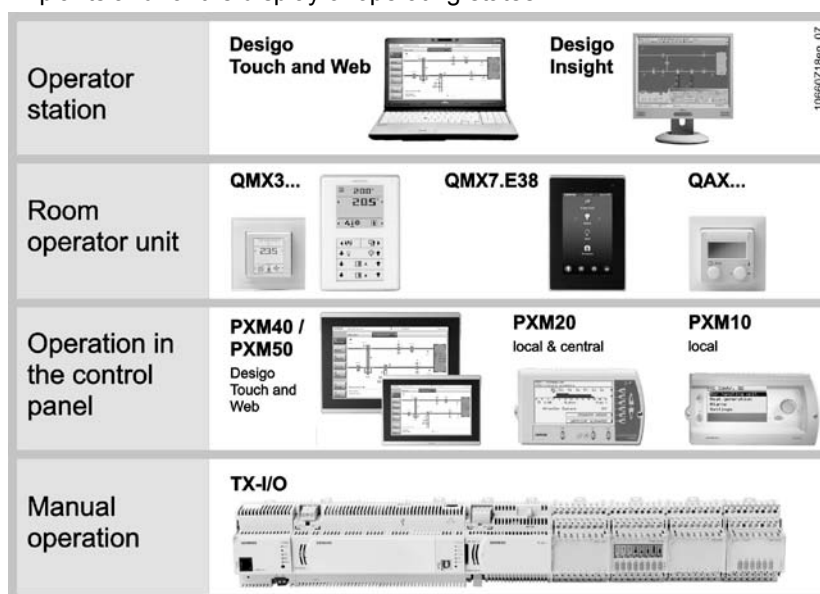
- Configurable Touch room operator unit QMX7.E38 with intuitive touch operating concept and capacitive color display and IP communication
- The QMX3 room operator unit with KNX PL-Link communication and optional Green Leaf symbol offers users functionality precisely matched to need
- QAX.. with or without display and operating element offers functionality matched to the specific needs of the user and the elegant QAX devices support both KNX and LONWORKS communications as well as wireless EnOcean technology

Plant operation

- The Desigo touch panel PXM40 (10 inch) and PXM50 (15 inch) to operate and monitor the Desigo PX automation level with graphical display, optimized to intuitive finger operation
- The user-friendly, graphics-based PXM10 operator unit facilitates full local operation of the Desigo PX automation stations
- The PXM20 network-compatible graphics-based operator unit presents Desigo PX plant and system information in an easy-to-understand format with a clear-text commentary

Manual operation

- The Desigo TX-I/O modules include facilities for manual/emergency operation of plants and for the display of operating states



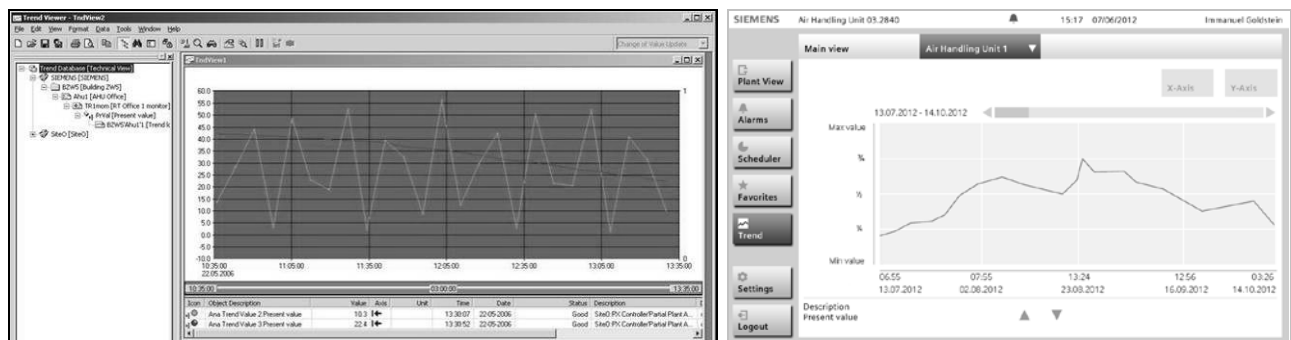
Desigo operating levels

Trend and history function

Fully integrated trend data processing allows effortless evaluation and analysis of real-time (online) data and (offline) historical data. The trend feature facilitates the monitoring and fine-tuning of the plant. In the Desigo system, this feature is implemented in the form of Trendlog and TrendlogMultiple objects, in compliance with the BACnet standard.

Trend logging options	Sampling options
Continuous logging	Polling
Single run	COV polling (Change of Value)
Logging over a specified period	Event-driven polling

Trend graphs can be displayed on the management station. In addition, the touch panels PXM40/PXM50 and operator units PXM20 as well as PX-Web can display Desigo PX trend graphs. The management station also allows displays in color and in 2D or 3D.



Trend Viewer on the Desigo Insight management station and on touch panels PXM40/PXM50

Online trend features	Offline trend features
<ul style="list-style-type: none">Real-time display of process dataBased on changes in the value of a data point (COVs) or on periodic sampling by Trend Viewer (times can be configured)	<ul style="list-style-type: none">Offline data display – no permanent connection requiredLonger periods of time (days, months)Data acquisition in the automation systemData are uploaded to the management level at regular intervals or as needed

Alarm management

One of the most important functions of a BACS is automatic alarming in the event of faults in building services plants. The management of alarms (generation, display and handling) must be simple, efficient and consistent at all levels of the system. Desigo uses the BACnet alarm functions and supports the following three types of alarms with up to 256 alarm priority levels:

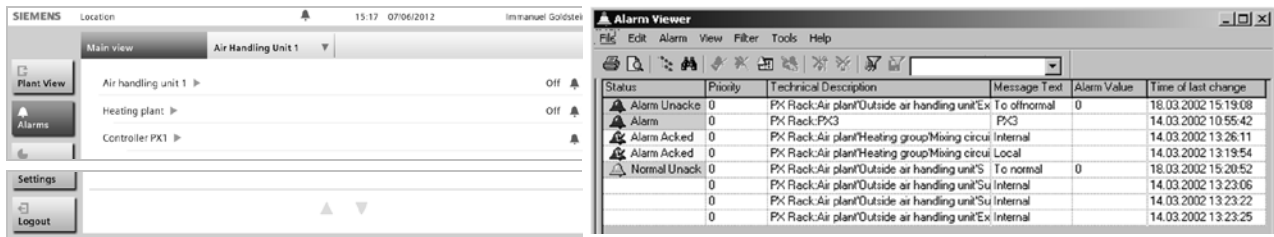
- Basic alarm (for alarms not requiring user interaction)
- Simple alarms (for alarms requiring acknowledgment)
- Extended alarms (alarms requiring acknowledgement and reset)

Alarm messages

When an alarm occurs, it is automatically detected, registered and transferred to operator units such as the touch panels PXM40/PXM50, the PXM20, or to the Desigo

Insight management station. Informative alarm messages are also transmitted to remote devices such as mobile phones, fax machines, printers or PCs and browsers, via SMS and e-mail. Desigo Insight further separates alarms in a customized manner so that each user receives only those alarms that correspond to his/her level of responsibility.

Alarm lists provide a view of all pending and time-stamped alarms at a glance and permit straightforward processing. Operators are alerted to incoming and pending alarms with pop-up windows and audible and visual signals.



Alarms on touch panel PXM40/PXM50 and on the Desigo Insight management station

Alarm routing

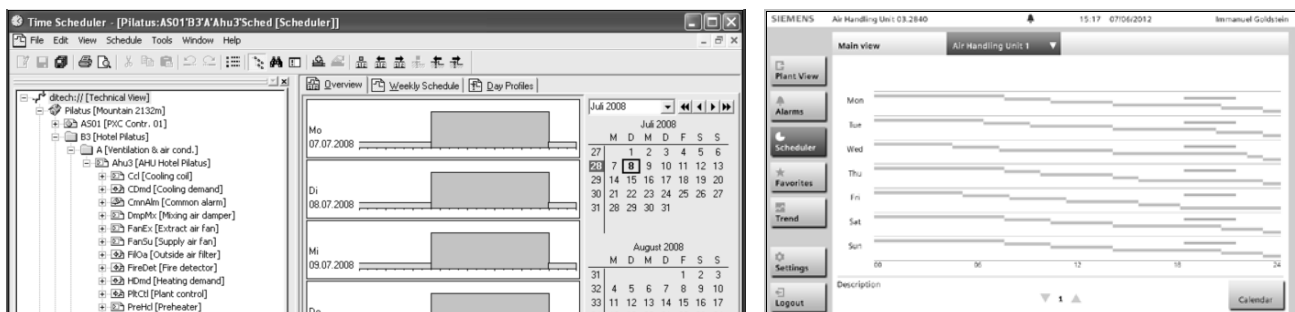
Alarms are transferred on the basis of time of day, priority and/or plant type, using a truly powerful alarm routing system at the management station. This ensures the uninterrupted routing of alarms, irrespective of whether or not there is an operator sitting at the management station. Users are supported in their work by various overview options which help ensure a fast and correct response even in critical alarm situations.

Schedulers/calendar

One of the basic functions of a BACS is time control of procedures and processes and ensuring energy-efficient operation.

Scheduler programs ensure that the heating and lighting are switched off automatically at the end of the workday, that the temperature in the building is reduced at night, and that the plant is not kept running for longer than necessary. They can also be used to switch off the air conditioning in certain rooms during holidays.

Using standard BACnet functions, the BACnet scheduler programs can be operated system-wide from the user-friendly touch panels PXM40/PXM50, the operator units PXM20 and PX-Web as well as from the Desigo Insight management station.



Scheduler program on the Desigo Insight management station and on touch panels PXM40/PXM50

For safety reasons, schedules and calendars are stored in the Desigo PX automation station, so that in the event of a network or PC failure, the automation level can continue to operate autonomously.

Access rights

Access rights can be used to filter information from the plant and system based on the individual requirements of a user. The caretaker or service engineer, for example, only has access to information important to him. A distinction can also be made between read access and write access.

Freely-definable access rights

Only authorized personnel are granted access to the system via the operator units. When a user enters a user name and password, the system verifies the associated access rights and enables access to the relevant plant. Read and write access rights can be defined in detail, right down to individual information points.

The following access classes are supported in the Desigo system:

- Internal, service and standard service
- Administration and experts
- Standard and customer

Efficient plant overview

For simple and efficient plant overview, the Desigo touch panels PXM40/PXM50 can display the most important plant values on an overview page, even without logging on.

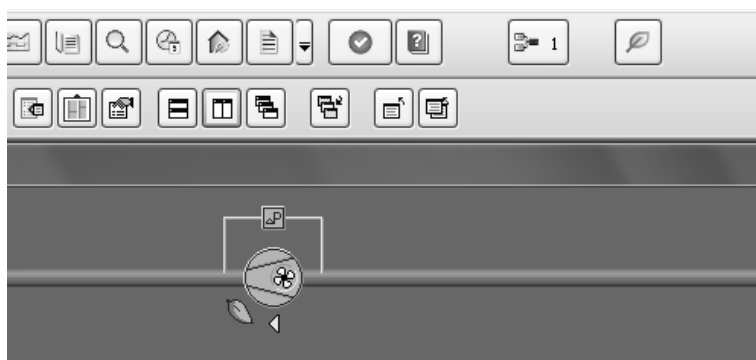
Monitoring functions

Increasing building efficiency/saving energy and extending the life of a plant

Thanks to sophisticated monitoring functions, Desigo provides comprehensive indication of the efficiency status in the building. Feedback occurs via uniform, easy-to-understand Green Leaf symbol, adjusted to knowledge and possible types of influence on the part of facility managers and room users.

The Desigo Eco Monitoring system function provides immediate feedback of the efficiency status of primary plants. Inefficient plant operation is indicated by an automatic change of color of the Green Leaf symbol from green to red. SMS, fax, or e-mail informs on uncommon events as needed. Desigo Insight Eco Viewer then allows the facility manager to quickly and efficiently analyze the problem and find a solution before unnecessary energy is consumed and wear and tear occurs.

The RoomOptiControl function of Desigo TRA automatically detects unnecessary energy consumption in the room. This is indicated to the room user via a change of color of the Green Leaf symbol from green to red on QMX3 or QMX7.E38 room operator units. When pressing the symbol, room control resumes energy-optimized operation. Then, the Green Leaf symbol will again return to green.



Green Leaf symbol on the Desigo Insight management station and on the QMX3 operator unit

Communication – networks

Communication standards specially developed for building systems

BACnet, KNX and LONWORKS

Compliant devices can be interconnected at low cost using the BACnet (Building Automation and Control network) open communication protocol. The worldwide BACnet standard was developed specifically for the needs of building services, under the auspices of ASHRAE (the American Society of Heating, Refrigerating and Air-Conditioning Engineers). BACnet networks provide all subscribers with access to all the data and functions of the connected devices.

For the exchange of information among its own system components, Desigo uses three standard protocols, recognized worldwide: BACnet, KNX (EIB) and LONWORKS. Desigo uses the BACnet communication protocol to exchange information between the individual Desigo PX automation stations and the Desigo TRA room automation stations on the one hand, and to the Desigo Insight management station on the other.

Desigo uses IP, LonTalk or PTP (point-to-point, modem or null modem) as the transport medium.

Furthermore, Desigo supports integration of BACnet/MSTP subsystems. The PXG3 router provides transparent BACnet traffic between the MSTP and IP network (BACnet/IPv4 as well as BACnet/IPv6) and, optionally, to LonTalk as an addition.

The integrated KNX connection on Desigo TRAs room automation station PXC3 permits direct integration of both devices with the KNX PL-Link as well as KNX S-Mode in Desigo TRA. Communication between room automation stations and field devices with KNX PL-Link is optimized within the framework of the KNX standard for available plug-and-play functionality including automatic device recognition. Desigo Tools parameterize devices with the KNX PL-Link; the KNX commissioning software (ETS) is not required. A broad selection of Siemens field devices, including room operator units, buttons, motion detectors, or VAV compact controllers support the KNX PL-Link.

Also, the Desigo RX room automation product range communicates per LONMARK standard or KNX S-Mode (EIB).

Thanks to the support of the BACnet Life Safety objects, simple and secure connection to fire detection systems such as Sinteso FS20 or Cerberus PRO to Desigo is possible without problems.

BACnet certification



All Desigo PX and TRA BACnet servers as well as the Desigo Insight management station were submitted to the BACnet Interest Group Europe (BIG-EU) for compliance testing based on the BACnet standard DIN EN ISO 16484-5 and successfully certified. A well-known testing institution conducted the comprehensive testing.

The management, automation, and room automation stations are all implemented as full BACnet nodes. BACnet is integrated directly without the need for any special data conversion.

The Desigo PX automation stations satisfy the B-BC profile (BACnet Building Controller). Desigo Insight satisfies the B-AWS profile (BACnet advanced workstation). The Desigo TRA room automation stations support a BACnet object's scope (BACnet B-ASC profile) adjusted to room automation.

AMEV guideline	<p>Open communication between various systems using a common automation and operating concept are key functions for energy-saving and reliable plant operation. As a consequence, Desigo meets in full the AMEV guideline "BACnet 2011" with the following profiles:</p> <ul style="list-style-type: none"> • Desigo Insight: AMEV profiles MBE-A and MBE-B • Desigo PX: AMEV profiles AS-A and AS-B
DALI, EnOcean	<p>DALI, EnOcean, and KNX devices turn the PXC3 room automation stations of Desigo TRA into a complete solution for the room.</p> <p>The optional DALI bus of the room automation stations allow for simple integration of different lamps and luminaires. DALI (Digital Addressable Lighting Interface) is a worldwide standard that applies specifically to lighting control at cost-efficient two-wire technology and integrated power supply.</p> <p>Self-powered EnOcean radio technology offers wireless connection of field devices based on extremely energy-saving technology. The operating energy required by the devices is taken directly from the environment. The wireless room units QAX9..4 can be used via EnOcean/LONWORKS or EnOcean/KNX gateway with Desigo TRA or RX.</p>
Desigo Terminal Server Desigo Web	<p>Desigo Terminal Server and Desigo Web make optimum use of the advantages of modern IT technology for the benefit of building services. Properly selected and used, they have a significant influence on the ability to fine-tune the running of the building and on the comfort and satisfaction of building users. This reduces maintenance and upkeep costs.</p> <p>Desigo Terminal Server provides all management station functions as terminal services in the network allowing users to simultaneously access the functions in independent sessions. Desigo Web is a true Web solution based on Microsoft IIS (Internet Information Server). Both Desigo Terminal Server and Desigo Web are described in detail in section "Operation and monitoring with web technology".</p>
Desigo Touch and Web	<p>Desigo Touch and Web permits operation and monitoring of the Desigo PX automation level using the Desigo touch panels PXM40 and PXM50 as well as via the standard Web browser (HTML5 technology) on various hardware platforms (e.g. tablets, notebooks/PCs, smartphones). The BACnet/IP Web interface PXG3.W100 supports in a straightforward manner flexible and remote access to the BACS via LAN/W-LAN connections.</p>
Connection of legacy systems	<p>Desigo is compatible with the legacy automation systems Unigyr, Visonik, Integral and allows their seamless integration. Changes in use, system extension and retrofit projects can all be handled in gradual stages. For example, previously installed PTM-I/O modules of Unigyr or Visonik can be connected directly to modular Desigo PXC..D automation stations. Existing actuators and sensors can continue to be used that way. In addition, parallel connection of further TX-I/O modules to the same automation station is easily possible.</p>

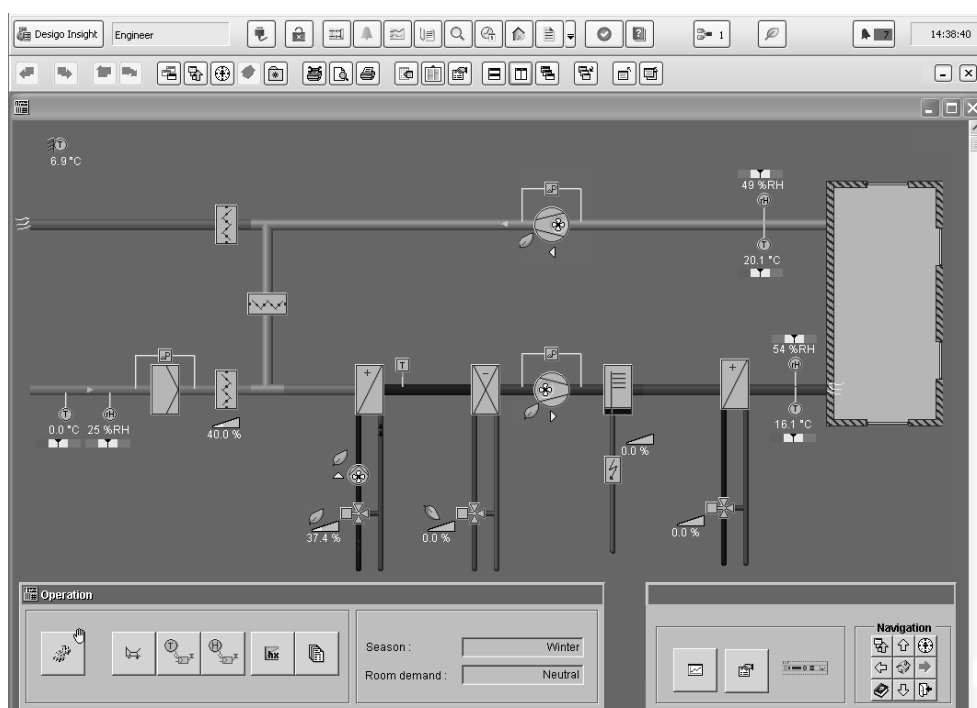
Desigo Insight management station

The clearly structured, modular and object-oriented software of the Desigo Insight management station is optimized to the current operating systems including Windows 7 and Windows 8.1 (business versions) or Windows Server 2012 R2 featuring 64-bit technology.

The functional scope and ease of use of the software reduces operating costs and familiarization time while maintaining operational reliability. The Desigo Insight applications are introduced below:

Applications in Desigo Insight

- **Plant Viewer:** Realistic plant graphics allowing fast, targeted monitoring and operation of the system
- **Scheduler:** Central programming of all time-controlled building services functions
- **Alarm Viewer:** Detailed overview of alarms to quickly localize and eliminate errors
- **Alarm Viewer Fire Safety:** Detailed overview to quickly assess fire detection system alarms
- **Alarm Router:** Flexible routing of alarms to printers, fax machines, mobile phones and e-mail
- **Trend Viewer:** Convenient analysis of trend data to optimize operations and increase energy efficiency
- **Report Viewer:** Snapshot queries to meet customers' needs and their display in reports. Reports provide information on plant operation analysis as well as evaluation and documentation purposes
- **Object Viewer:** An efficient tool for navigation through the hierarchical tree structure to all the data points in the system. These points can then be read or manipulated, depending on the access rights of the user concerned
- **Log Viewer:** Alarms, errors and user activities are logged in chronological order and can be displayed for further evaluation, as needed
- **Eco Viewer:** Fast and easy analysis of the efficiency status of primary plants
- **Database Audit Viewer:** Log unauthorized changes in databases (audit trail) guaranteeing the highest possible data integrity
- **Reaction Processor:** System-wide monitoring of plants and processes based on certain criteria (events). The reaction process triggers predefined (re) actions when one (or a combination) of the criteria are met. Allows for centralized time control of plants without scheduler programs/calendar functions
- **System Configurator:** Used to configure the general setup of the Desigo Insight management station and associated applications
- **Graphics Builder:** Efficient creation of customized plant graphics
- **Online operator tools** for existing systems



Plant Viewer

Task bar

A task bar appears after starting Desigo Insight. It provides fast and direct access to all the user applications and displays important status information.




















In the case of several remote plants, it is possible to switch from one plant to another via the task bar, subject to the appropriate access rights. This ensures clear demarcation lines between the various levels of responsibility.

The user's entry into the system is simplified by user-specific start sequences with preselected programs and plant.



The Desigo Insight task bar

The icons on the task bar provide access to the main user applications:

	Connect and disconnect sites
	Login and logout, restart, lock or shutdown
	Plant Viewer – the graphical interface to the plant
	Alarm Viewer – displays the state of abnormal alarm points
	Trend Viewer – displays graphs containing live data
	Log Viewer – displays all event messages including alarms
	Database Audit Viewer – logs unauthorized changes to databases
	Object Viewer – shows all data points in the system, in list form
	Eco Viewer: Fast and easy analysis of the efficiency status of primary plants
	Scheduler – allows the user to modify plant switch times
	Report Viewer – displays reports of momentary values recorded and compiled by the user
	Reaction Processor – allows automatic triggering of cross-system process reactions
	Alarm Router – routes alarms to printers, fax machines, mobile phones and e-mail systems
	System fault indication
	Online help
	Number of connected sites
	Pending alarms in order of priority
	Pending fire safety alarms, e.g. from Sinteso FS20 or Cerberus PRO, sorted by priority
	Green Leaf indication – higher, immediate feedback of the efficiency status of primary plants

Background functions in Desigo Insight

- Life Check feature for checking the connection to automation systems
- User log on using Windows authentication – Windows OS administers password guidelines, such as password expiration and security. Automatic log on to Desigo Insight when user accounts match
- Alarm upload after system start
- Check on unauthorized login attempts
- The "Scopes" function provides customized information views. You can adapt the amount of information available to individual users based on need and competencies. Unwanted information (objects) are hidden for the given applications. For example, only messages are displayed in Alarm Viewer for which the user is responsible. Furthermore, multiple user can work on the same system without access to certain information intended for other users (especially useful in connection with remote operator stations)

Security functions in Desigo Insight

- Management station locked by timeout after period without user activity
- Time synchronization between management station and automation stations
- Verification of hard disk memory capacity and availability of database
- Redundant design provides high availability of Desigo Insight. The primary server switches automatically to the standby system in the event of a hardware failure. The management station is again available without loss of data after a minimum interruption

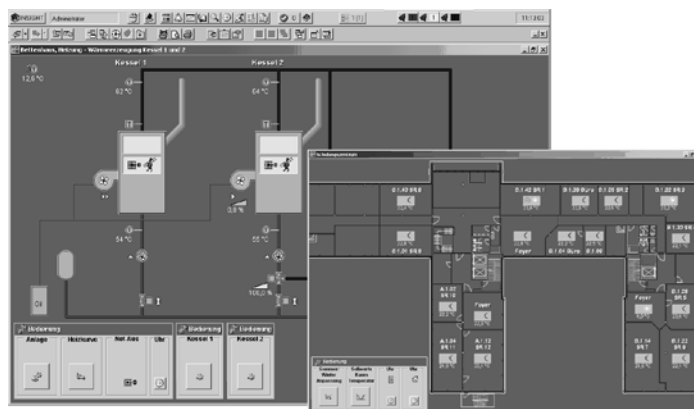
Plant Viewer

Plant Viewer displays the areas of a building and the associated plants in graphical form. The user works interactively with these views to monitor and control the data points throughout the building. Values can be modified and alarms can be acknowledged by clicking on the corresponding object.

Process display

The Plant Viewer is based on SCADA technology.

Several windows of different sizes can be displayed simultaneously (overlapping or tiled). Even large graphics such as floor plans, etc., can be accommodated, and the freely definable page size makes them easy to view.



Process display

Real-time display

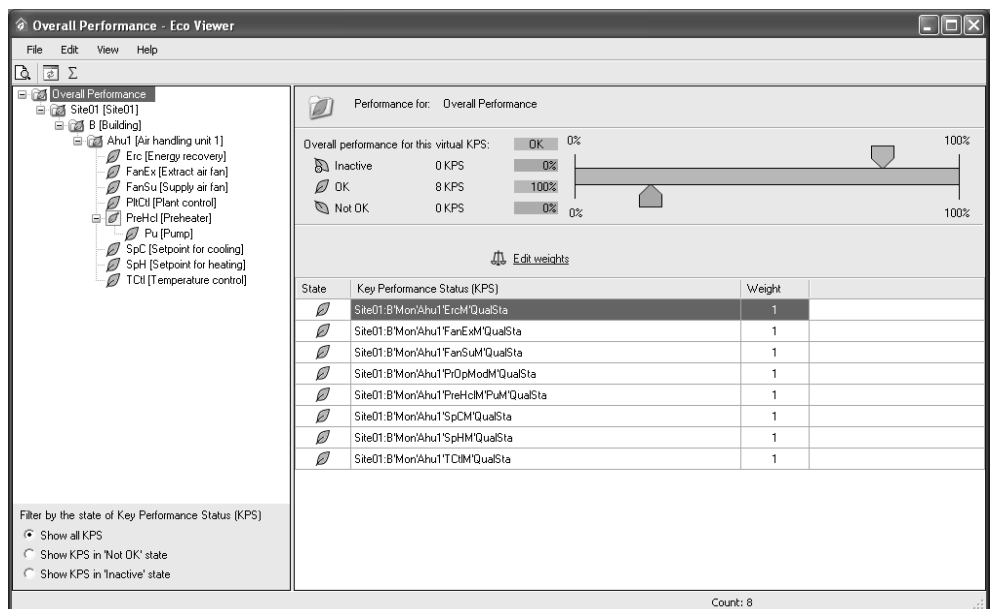
Actual values, setpoints, operating states and alarms are displayed on the screen in real-time and updated continuously. The display form is determined during engineering. Changes are indicated either by the object symbol, e.g. through animation or a change in shape or color, or by the movement of, or a change in the color, shape, text or animation of the values affected.

Other features of Plant Viewer

- Genuine multitasking with fully dynamic functioning of all active pages
- Object-oriented plant operation and monitoring
- Freely definable page sizes for versatile handling of several pages on the same screen
- Page selection via dialog box, context menu or hyperlinks
- Integrated standard page selection features based on the page naming strategy. Standard functions such as Last/Next/Top, etc.
- Object-oriented navigation between applications
- Definition of and quick access to "Favorites"
- ToolTips for all dynamic objects, with the option of user, technical or system designation
- Context-specific information such as text, photos or maintenance information can be added to each dynamic symbol
- Black-and-white or color graphics printing
- Import of Windows 32-bit supported graphics file formats such as AutoCAD and PXC
- User privileges for access to different levels
- Tools for efficient and error-free engineering

Eco Viewer

The Desigo Eco Monitoring system function provides basics for decision making regarding economical operation of all primary plants and prevents unnecessary energy consumption and wear and tear. Violations of limit values are indicated automatically by a change of color of the Green Leaf symbol from green to red on the task bar, the Eco Viewer, and Plant Viewer. Desigo Eco Viewer – based on reference data (quality state indicators) – shows the efficiency of primary plants in real time (baseline comparison). To evaluate the data, the value determined from the expired period is recorded in a Trendlog object.



Eco Viewer

Scheduler

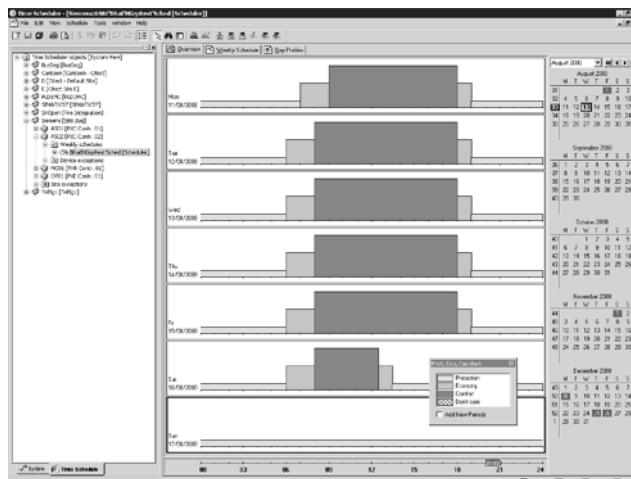
Graphics-based operation

The Scheduler application in Desigo Insight is used for central programming of all time-controlled functions of the building services systems, including individual room control.

Thanks to graphics-based operation of the weekly schedules and exception programs, the user can easily modify and/or optimize scheduler programs at any time.

Primary functions

- Graphics-based overview and handling of all scheduler programs in the system
- Easy graphics-based programming of switching times
- Programs invoked directly from the plant graphics
- Logging user activities
- Direct entry of various operating modes (e.g. Comfort, Standby, Energy Lock)
- Storage and processing are independent of the management station
- Reports printed in different display formats
- Calendars operated via the same easy-to-use interface



System Browser view, and overview of daily profiles in the Scheduler application

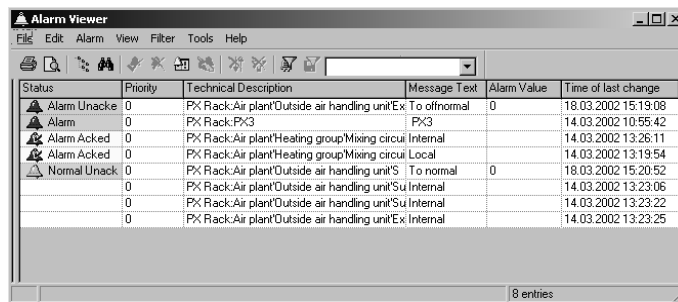
Alarm Viewer

The Alarm Viewer application displays alarms by type and provides the user with helpful information as to the type of action required by the system. With its extensive filter and search functions, Alarm Viewer facilitates fast and targeted access to the required information.

In larger systems with more than one management station, all stations access the same alarm database. An alarm for any given management station is entered in this database and automatically displayed on all other stations.

Functions in Alarm Viewer

- Display, acknowledgement and resetting of single or multiple alarms
- Display of associated alarm property sheet with detailed data point information
- Reading the associated alarm help text with operating instructions or additional information in text form
- Object-based navigation to other applications, such as Plant Viewer or Log Viewer



Status	Priority	Technical Description	Message Text	Alarm Value	Time of last change
Alarm Unack	0	PK Rack:Air plant'Outside air handling unit'Ex	To offnormal	0	18.03.2002 15:19:08
Alarm	0	PK Rack:PK3	PK3		14.03.2002 10:55:42
Alarm Acked	0	PK Rack:Air plant'Heating group'Mixing circui	Internal		14.03.2002 13:26:11
Alarm Acked	0	PK Rack:Air plant'Heating group'Mixing circui	Local		14.03.2002 13:19:54
Normal Unack	0	PK Rack:Air plant'Outside air handling unit'S	To normal	0	18.03.2002 15:20:52
	0	PK Rack:Air plant'Outside air handling unit'Su	Internal		14.03.2002 13:23:06
	0	PK Rack:Air plant'Outside air handling unit'Su	Internal		14.03.2002 13:23:22
	0	PK Rack:Air plant'Outside air handling unit'Ex	Internal		14.03.2002 13:23:25

8 entries

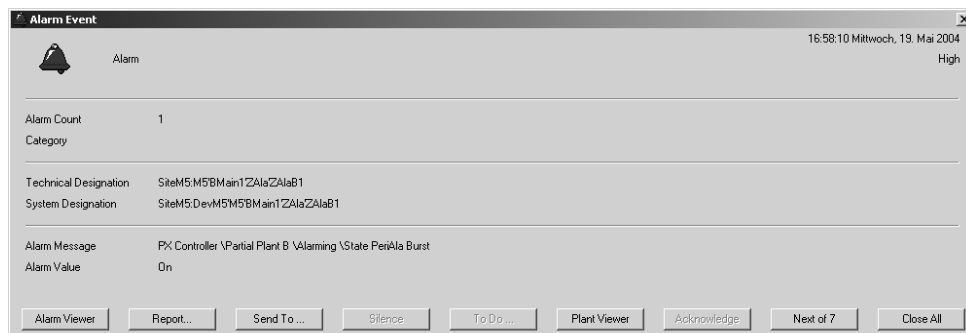
Alarm Viewer

Popup window

The popup window is an important means of attracting the attention of the user in the event of an alarm. Incoming alarms are displayed in a pop-up window that opens on the Windows desktop and appears in the foreground of all other applications – including third-party applications.

If several alarms occur, they are displayed one after the other. An audio file (.wav) can be added to each alarm window defined to further alert the user to the alarm with an audible signal.

The appearance of the pop-up window can be varied for each alarm category. From this window, the user can invoke helpful instructions about the required response to the alarm, or jump directly to other applications such as Plant Viewer or Alarm Viewer.



Alarm Event

Alarm

16:58:10 Mittwoch, 19. Mai 2004
High

Alarm Count: 1

Category:

Technical Designation: SiteM5.M5BMain1ZAlaZAlaB1

System Designation: SiteM5.DevM5M5BMain1ZAlaZAlaB1

Alarm Message: PK Controller \Partial Plant B \Alarming \State PeriAla Burst

Alarm Value: On

Alarm Viewer Report... Send To... Silence To Do... Plant Viewer Acknowledge Next of 7 Close All

Alarm Popup

Alarm Router

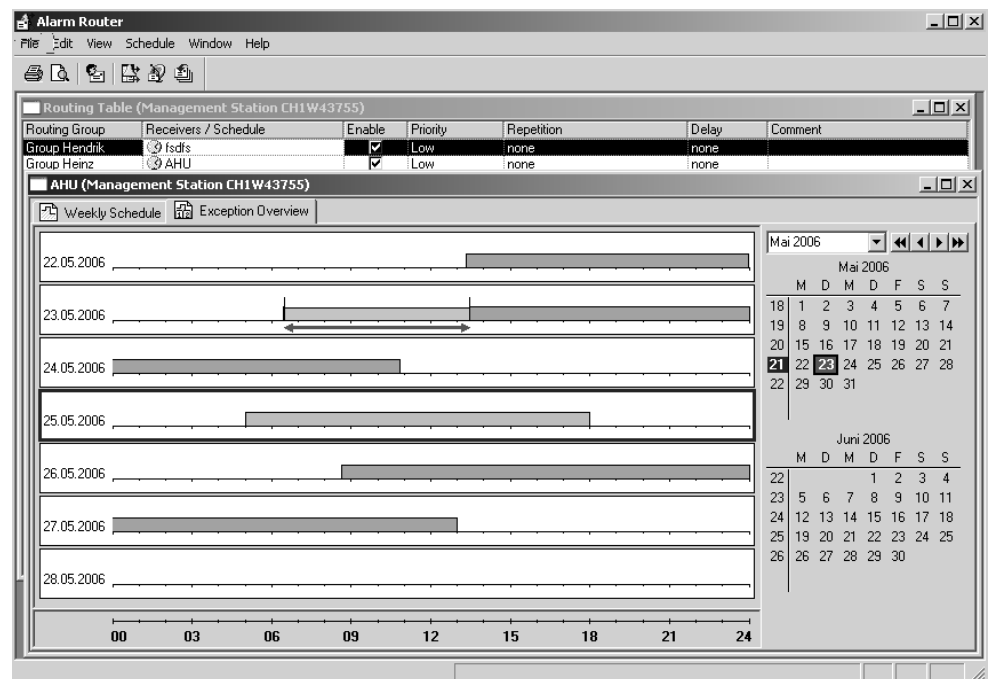
The Alarm Router application provides highly effective building management. Important messages or events in the BACS are transferred to specific receivers with no need for any user action at the management station. Alarm Router is a background application which starts when Desigo Insight is started, whether or not a user or site is connected. Alarms and important system events can be transferred via the following media:

Printers
Faxes
Pagers
Mobile phones
E-mail systems

Criteria for alarm routing

Alarms can be grouped according to various criteria. A routing table defines the conditions under which these alarm groups are routed to the assigned receivers. The alarm messages are routed to alternative receivers in the event of connection problems. The criteria include the following, for example:

- Schedules and exceptions (e.g. at night, switching to the printer in the security guard's office)
- Responsibility for the site (e.g. sending a fax to the company responsible for maintaining the system)
- Urgency of the alarm (e.g. calling the caretaker only via pager in the event of high priority alarms)



Alarm Router

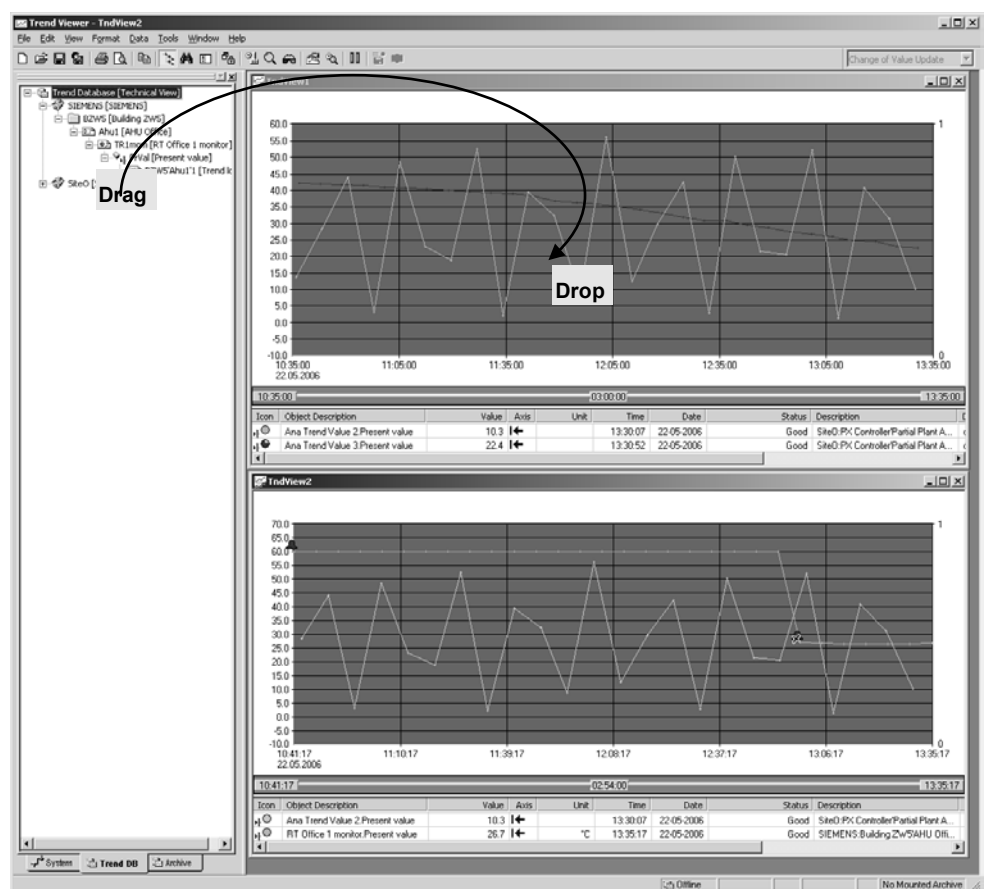
Trend Viewer

The Trend Viewer application is used to review current process data in real time (online) and past process data (offline) over a period of time. Trend Viewer is an easy-to-handle tool used to optimize plant operation and reduce costs.

Trend Viewer tasks

- Logging process and measured values over a period of time
- Minimum and maximum values retained in graphs irrespective of time range
- Monitoring current plant conditions
- Plant optimization and fine-tuning
- Response times appropriate for the support of large trend databases

Up to ten process values can be displayed in 2D and 3D graphs in a single trend view. Both online and offline data can be displayed simultaneously in separate windows, enabling the user to compare past and current situations.



Drag & drop in Trend Viewer

Trend logging

Essentially, trend data can be displayed in three different modes:

- Online trend logging: Displays real-time process data which are updated whenever a change of value (COV) occurs, or as the result of a time-based scan
- Offline trend logging: Displays past process data which have been uploaded to a database at the management level
- Archive data: Displays older data which have been moved from the trend database into archive files

The trend views can be saved and retrieved at a later date. Online trend data are continuously logged and stored in the trend database.

Object Viewer

Object Viewer helps users of the BACS to navigate efficiently through the entire structure; data objects can be easily selected.

Object Viewer supports three different hierarchical views

- **Technical View**

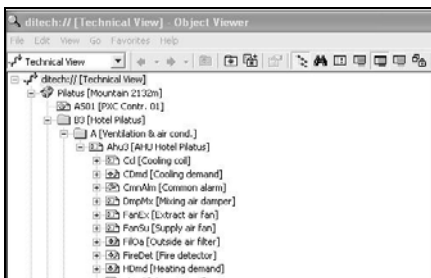
Technical View is the plant-based standard view associated with the technical designation.

- **User View**

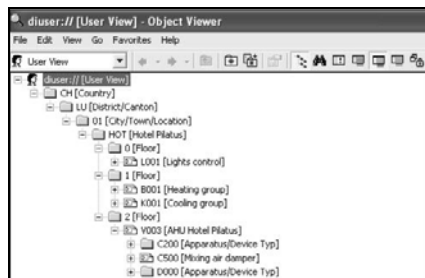
User View is based on customer-specific user designations (user addresses).
The address structure and contents are defined as part of the automation level engineering process.

- **System View**

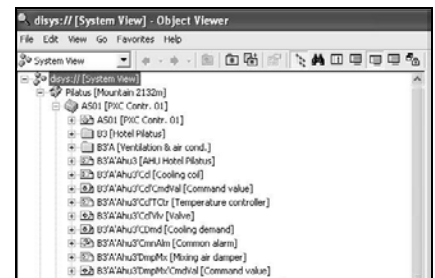
The System View is a standard hierarchical view, representing the topology of the BACnet network, whereby a site contains devices and each device contains objects.



Technical View



User View

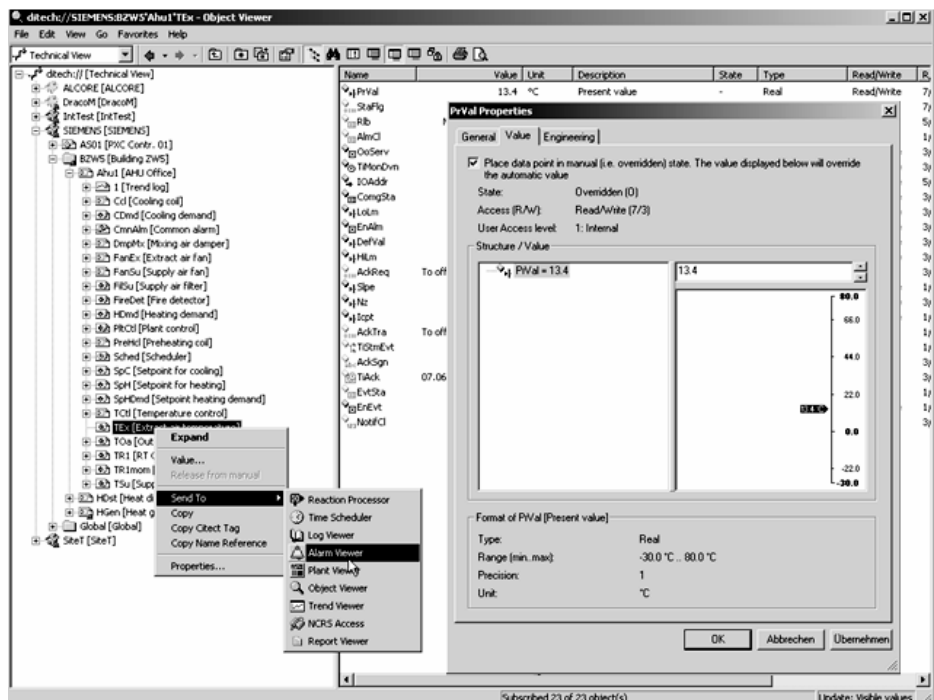


System View

Various System Browser views

System Browser

The left pane of Object Viewer contains the System Browser, which displays a hierarchically structured view of the system (tree structure). The right pane of Object Viewer displays the contents of the currently selected object.



Detailed alarm display in Object Viewer

Functions in Object Viewer

- Fast navigation through the BACS
- Quick detection of objects and alarms
- Detailed information on the properties of each object
- Display of real-time process data
- Change of setpoints and parameters and manual override of outputs
- Jump functions back/forward
- Modification and definition of object-related text
- Function with Wild Cards for quick and direct access to certain objects
- Object search in other views by changing view in context menu
- Supports read/write access levels
- Object Editor: User-friendly interface for editing all imported objects

Log Viewer

Log Viewer provides users with access to all events that have occurred within the system. Events and user activities are archived in chronological order in the log database and can be viewed whenever required.

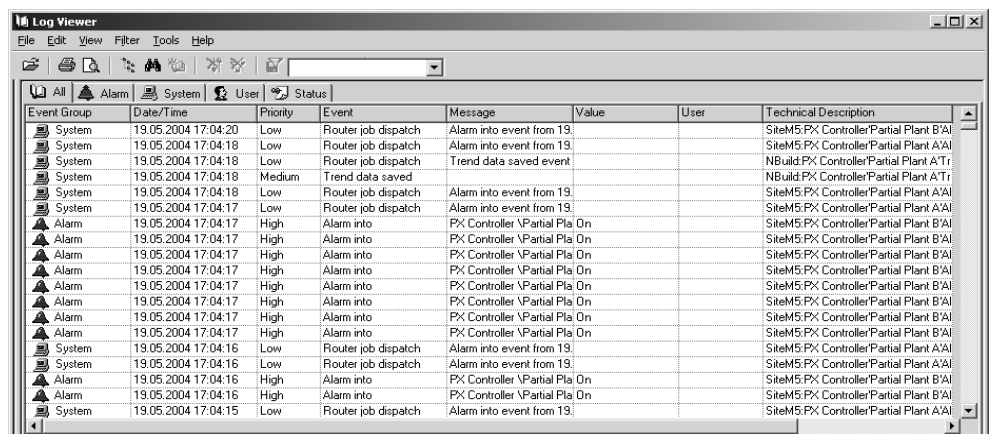
Event Handler

The data logging system is a background service performed by the Event Handler in Designo Insight, which continuously logs reported events as follows:

Events in Log Viewer

- Alarm events from the process level, such as plant alarms and high priority warnings. The alarm is logged when it occurs, and thereafter upon acknowledgment, reset and return to normal
- System events from Designo Insight management stations and automation level. Examples include communication failures, selection procedures, startup, shutdown, hard-disk monitoring, battery checks, etc.
- User events for reporting user activities on the management station. These include authorized and unauthorized user log-in procedures and the handling of values, parameters and setpoints, etc.
- Status events from the process level, such as plant On/Off, etc.

The user interface of Log Viewer has the same look & feel as the Alarm Viewer and is based on the same versatile sort and filter functions.



The screenshot shows the Log Viewer application window with a menu bar (File, Edit, View, Filter, Tools, Help) and a toolbar. Below the toolbar is a tabbed interface with tabs for All, Alarm, System, User, and Status. The 'All' tab is selected, displaying a table of events. The table has columns for Event Group, Date/Time, Priority, Event, Message, Value, User, and Technical Description. The events are listed in chronological order, starting from 19.05.2004 17:04:15 and ending at 19.05.2004 17:04:20. The events include Router job dispatch, Alarm into event from 19, Trend data saved, and Alarm into.

Event Group	Date/Time	Priority	Event	Message	Value	User	Technical Description
System	19.05.2004 17:04:20	Low	Router job dispatch	Alarm into event from 19.			SiteM5.PX Controller/Partial Plant B/AI
System	19.05.2004 17:04:18	Low	Router job dispatch	Alarm into event from 19.			SiteM5.PX Controller/Partial Plant A/AI
System	19.05.2004 17:04:18	Low	Router job dispatch	Trend data saved event.			NBuild.PX Controller/Partial Plant A/Tr
System	19.05.2004 17:04:18	Medium	Trend data saved				NBuild.PX Controller/Partial Plant A/Tr
System	19.05.2004 17:04:18	Low	Router job dispatch	Alarm into event from 19.			SiteM5.PX Controller/Partial Plant A/AI
System	19.05.2004 17:04:17	Low	Router job dispatch	Alarm into event from 19.			SiteM5.PX Controller/Partial Plant A/AI
Alarm	19.05.2004 17:04:17	High	Alarm into	PX Controller \Partial Pla On			SiteM5.PX Controller/Partial Plant B/AI
Alarm	19.05.2004 17:04:17	High	Alarm into	PX Controller \Partial Pla On			SiteM5.PX Controller/Partial Plant B/AI
Alarm	19.05.2004 17:04:17	High	Alarm into	PX Controller \Partial Pla On			SiteM5.PX Controller/Partial Plant B/AI
Alarm	19.05.2004 17:04:17	High	Alarm into	PX Controller \Partial Pla On			SiteM5.PX Controller/Partial Plant B/AI
Alarm	19.05.2004 17:04:17	High	Alarm into	PX Controller \Partial Pla On			SiteM5.PX Controller/Partial Plant B/AI
Alarm	19.05.2004 17:04:17	High	Alarm into	PX Controller \Partial Pla On			SiteM5.PX Controller/Partial Plant B/AI
Alarm	19.05.2004 17:04:17	High	Alarm into	PX Controller \Partial Pla On			SiteM5.PX Controller/Partial Plant B/AI
Alarm	19.05.2004 17:04:17	High	Alarm into	PX Controller \Partial Pla On			SiteM5.PX Controller/Partial Plant B/AI
Alarm	19.05.2004 17:04:17	High	Alarm into	PX Controller \Partial Pla On			SiteM5.PX Controller/Partial Plant B/AI
System	19.05.2004 17:04:16	Low	Router job dispatch	Alarm into event from 19.			SiteM5.PX Controller/Partial Plant A/AI
System	19.05.2004 17:04:16	Low	Router job dispatch	Alarm into event from 19.			SiteM5.PX Controller/Partial Plant A/AI
Alarm	19.05.2004 17:04:16	High	Alarm into	PX Controller \Partial Pla On			SiteM5.PX Controller/Partial Plant B/AI
Alarm	19.05.2004 17:04:16	High	Alarm into	PX Controller \Partial Pla On			SiteM5.PX Controller/Partial Plant B/AI
System	19.05.2004 17:04:15	Low	Router job dispatch	Alarm into event from 19.			SiteM5.PX Controller/Partial Plant A/AI

Log Viewer

Functions in Log Viewer

- Query configurations can be stored and re-used. Display of current filter and sorting state
- Log Viewer is divided into tabs Alarm, System, User and Status, enabling the user to preselect events of a particular category
- Columns can be flexibly rearranged, resized or hidden as required
- The events logged for a specific object, such as events associated with a given site, automation station or data point, can be located quickly in the left pane (System Browser)
- Logging of changes in the project configuration
- Parameter change feature also includes initial parameter value

Log and trend data archiving

Logged data is saved and exported on an SQL server.

The archiving function serves to remove data from the runtime databases. This is necessary to first create space for new data in cases where storage capacity is normally limited and, second, to store the data in a suitable form for retrieval at a later date. The removed data is archived in a safe location for later retrieval and display if required. Data is archived in Desigo Insight automatically on the basis of time or quantity of data accumulated, or manually by the user.

Report Viewer

The Report Viewer allows the user to select existing report templates to manually start present value data acquisition. A report is then generated with the values for the plant data defined in the template at the time the data is recorded (snapshot function). Preselected reports can even be automatically executed together with the Reaction Processor.

The reports displayed on the screen can be printed or stored as PDFs for documentation purposes. An export to CSV file format allows for additional evaluation of recorded data values in other programs (Microsoft Excel or Microsoft Access).

Filters

Filter criteria for searches may be entered to display only the data the user desires in the reports (address masks "Wildcards", by plant, data point type, time of day, date, etc.).

Standard report templates

The following standard report templates are available with Desigo Insight:

- Reports to record alarm and fault states (active, unconfirmed, etc.)
- Reports to record logbook entries (alarm, system and user events)
- Reports to record plant states (manual override, maintenance requirement, room measured values, actual values, setpoint settings, etc.)

Customized report templates

The "Report Builder" tool creates customized templates for customers requiring their own template reports. The Report function with standard report templates is included as part of the basic license; the Report Builder, however, requires a separate license.

Creating and querying reports via the web

With the appropriate access rights, a Desigo Web client PC user may select existing report templates on the Desigo Insight computer via the Web Report Viewer and start present value recording. The generated report is displayed in Desigo Web and can be saved or printed as a PDF file and downloaded from the Web server to the client computer.

Reaction Processor

The Reaction Processor is an event program capable of system-wide monitoring of plants and processes for the occurrence of certain criteria (events) such as time of day, date, changes of values or exceeding limit values. The Reaction Process triggers preconfigured (re) actions when one (or a combination) of the criteria are met. The user can define the entries in the Reaction Processor.

Global scheduler with calendar function

Desigo Insight has a global scheduler with calendar functions on the system management level to execute reactions at predefined times of the day (schedule) or on certain days (calendar/date). You can even control plants and devices on the automation level accordingly without time and calendar functions!

Primary application for the Reaction Processor

- Reaction Processor automates a user's routine work
- The Reaction Processor includes a global scheduler/calendar program at the management level for plants integrated at the automation level without a time switch
- Automated control and switching of plants based on events occurring and monitored during operation
- Automated startup and routing of reports

Operation and monitoring with web technology

Desigo Web and Desigo Terminal Server make optimum use of the advantages of modern IT technology for the benefit of building services.

- Properly selected and used, they have a significant influence on the ability to fine-tune the running of the building and on the comfort and satisfaction of building users
- They distribute building information to the person who needs it, and in the exact location where it is needed
- In addition to flexibility of operation, both solutions contribute substantially to a reduction in the day-to-day costs of modifications, extension, maintenance and data backup
- Both solutions are based on software standards and are therefore compatible with today's IT security strategies (firewalls, Virtual Private Networks (VPN), etc.)

Designo Terminal Server

Designo Terminal Server provides all the functions of the management system in the form of terminal services over the network. These services can be accessed simultaneously by different users in independent sessions. In addition to the operation and monitoring programs for day-to-day operation of the plant, engineering tools are also provided, allowing modification and extension of the system while it is running.

This makes the Designo Terminal Server the optimum solution for professional facility managers who need unrestricted access to building data via their intranet or extranet, from any location. All the user requires is a simple, standard network-compatible terminal device such as a PC, Net PC or Web pad with a Microsoft operating system, without other installed software components (Thin Client).

Security is a top priority: Remote access from client devices is via Microsoft Remote Desktop Web Connection with the highly encrypted Remote Desktop Protocol (RDP) 5.0 which uses RSA Security's RC4 cipher with the option of 40-, 56- or 128-bit encryption.

Designo Terminal Server is based on the Windows Server operating system with the Terminal Server component and runs on standard server hardware. The hardware and software specification depends on how intensively it is used, with the number of users requiring simultaneous access being a decisive factor.

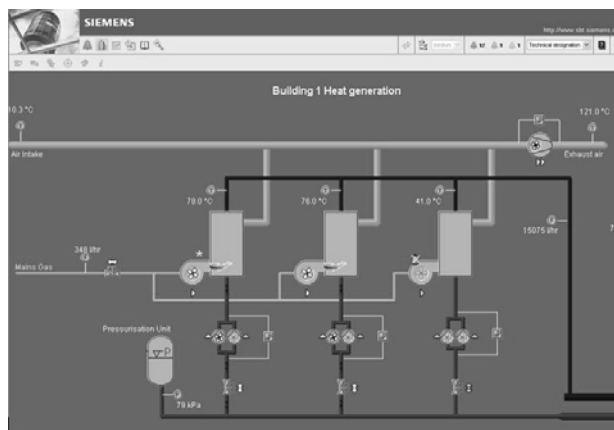
Designo Web

Designo Web is a genuine Web solution based on Microsoft IIS (Internet Information Server). The programs for operation of the management system are mapped to ASPs (Active Server Pages) in special interfaces optimized for current Web browser versions of Microsoft Internet Explorer and Firefox.

Functions in Designo Web

- Operation of graphics (Plant Viewer)
- Operation of data points (Object Viewer)
- Alarms and log (Alarm Viewer, Log Viewer)
- Trend data (Trend Viewer)
- Schedules (Scheduler)
- Report Viewer

This makes Designo Web the optimum solution for those responsible for technical services (such as the caretaker, facility manager or security staff) that track the day-to-day operation of the building and need easy access to all the key functions. In addition, it makes new options available, enabling selected building data and user access to be allocated relevantly to tenants and users of the building (e.g. room operation, schedules and display of room conditions).



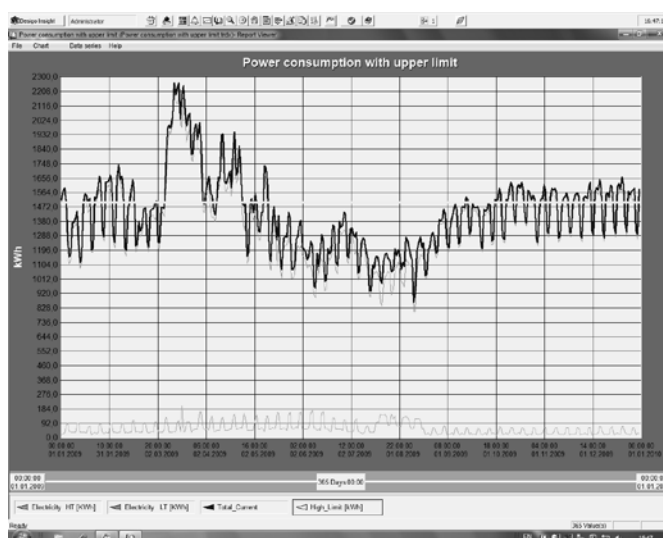
Web Plant Viewer

Energy Reports

Energy Reports can easily check a building for energy efficiency based on predefined reports. The data evaluation and reporting program guarantees gap-free processing and presentation of all operational data.

The high availability and optimum use of building services plants are very important. In pursuit of this goal, Energy Reports represents a basic requirement.

Energy Reports compiles powerful reports from the data stored in the process data management database in any number of combinations and selectable periods. The reports can be displayed and printed in various forms.



Example of a line graph showing the metered energy consumption and the comparative values of the previous year.

Energy Reports focuses on the powerful presentation of consumption data.

- The following report templates are available to efficiently create Energy Reports:
 - Energy consumption report
 - Energy cost report
 - Weighted consumption report
 - Corrected heating degree day report
 - Energy benchmark report
 - CO₂ benchmark report
- Multiple reports can be generated and stored for each report type
- Up to 10 data series per report are possible
- Comparison reports with previous years (1-2 years)

In addition to Energy Reports, advanced software packages for energy-efficient building operation are available. Also refer to section "Energy management".

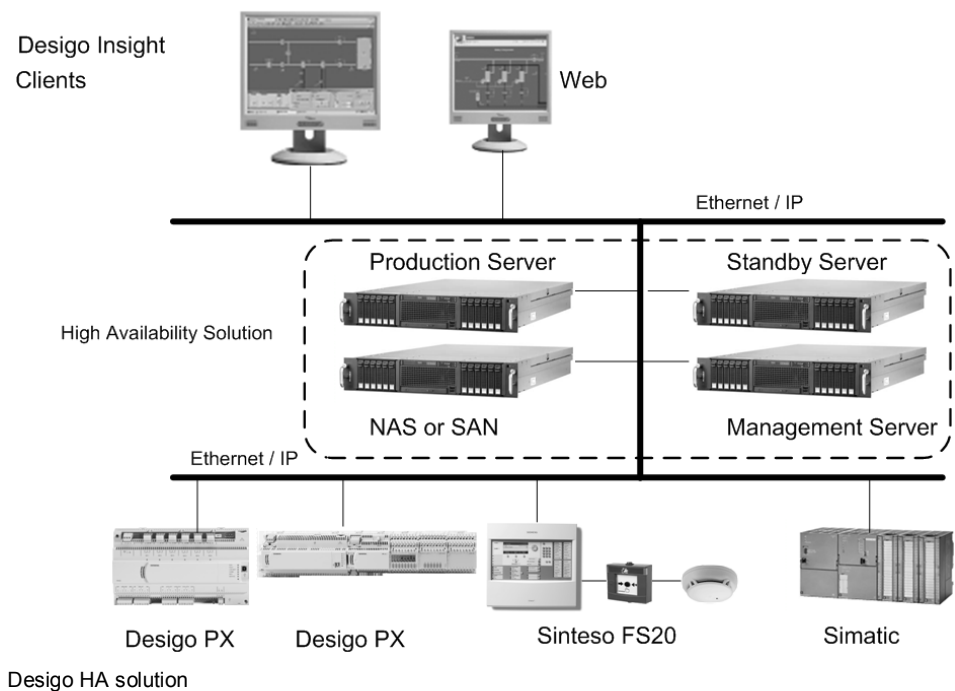
Desigo high availability solution

The Desigo high availability solution (HA) guarantees higher reliability, availability and data security for Desigo Insight and InfoCenter, in particular for plants with increased security requirements such as pharma production facilities, high-tech industry, airports, data centers, etc.

The Desigo HA solution is based on standard IT components and consists of two or more physical servers together with ESX server virtualization software from VMware.

The HA solution includes the following functionality:

- Continuous monitoring of all physical servers in a pool and restart of the Desigo Insight server on the backup server without human intervention in the event of a hardware fault
- Monitoring the operating system, automatic restart of service if a malfunction occurs
- Detection of server hardware faults thanks to mutual heartbeat functionality
- Immediate restart of virtual machines without human intervention on another physical server within the server pool
- Informing specialist in the event of fault
- VMware Infrastructure Manager (VIM) for server administration



Desigo PX automation level

Desigo PX excels in consistent openness of the system and the scalability of its freely programmable automation stations and operator units. Desigo PX reliably meets all expectations associated with the control and monitoring of building services. With its modular system design, Desigo PX can be ideally adapted to specific requirements and needs, making cost-effective DDC technology a possibility even in smaller HVAC systems. Whether for new buildings or modernization projects, investment costs are limited to the system components that are actually needed. This innovative system strategy allows phased extension of Desigo PX into a BACS as and when required.

A range of graded operator units

Building users and facility managers benefit from a comprehensive range of touch panels and operator units which can be used for targeted modification of comfort conditions or of the whole plant.



Touch panels and operator units

Desigo Touch and Web permits convenient operation and monitoring of complex building-technical plants via touch panels as well as standard Web browsers (HTML5-technology) on various hardware platforms (e.g. tablets, notebooks/PCs, smartphones).

The right operator unit in the right place

- For the caretaker: With optimized operator units, it is easy to check the functioning of the building services systems or to take account of changes in occupancy by adapting the extensive schedules
- For building users: Room units optimized for building occupants can be used for simple and direct local operation of the plant. So, for example, the temperature in a meeting room can be straightforwardly readjusted to meet individual needs
- Monitoring and operation via PX-Web: In the event of faults in the plant, Desigo PX transmits SMS and allows remote diagnostics via Web client

Operation of the Desigo PX automation level

Desigo Touch and Web

Especially ergonomic finger operation of the PXM40 (10 inch) and PXM50 (15 inch) Desigo Touch and Web permits complete operation of Desigo PX automation stations via the BACnet/IP Web interface PXG3.W100.



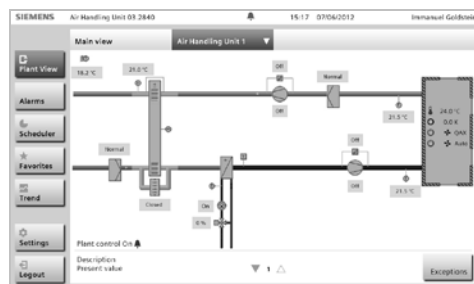
Simply touch the screen to operate the high-resolution capacitive displays. Intuitive operating functions are optimized to minimize tapping: Tap the object to display status; adjustable values can be edited via dialogs.



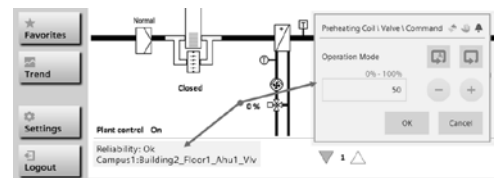
Both touch panels offer a high-resolution color display with strong contrast in landscape mode and featuring a large field of view. The devices are optimized for permanent plant monitoring as well as front mounting on control panel doors. The touch panels independently switch to energy-saving standby mode.

In addition to the plant overview, the touch panel offers, among things, an alarm list on faults, and alarms can be acknowledged and reset. An LED integrated in the housing indicates alarms even if the display is off.

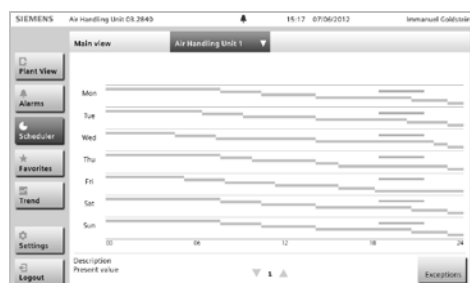
The Web interface PXG3.W100 also permits access via a standard Web browser.



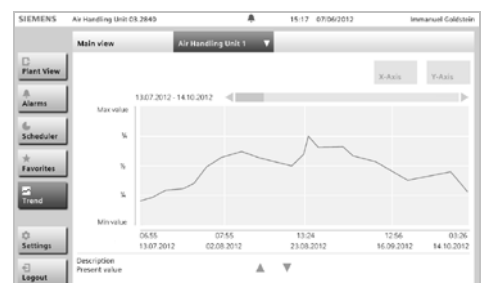
Plant overview



Display/operation of objects via dialogs



Scheduler program



Offline trend data



Alarm list



Favorites

Operating functions Desigo Touch and Web

- Graphical display of plants with intuitive operation
- Object display and operation including all actual values and setpoints, plant and operating states via dialogs
- Graphical display and operation of scheduler programs, exception calendar (in profile and list view)
- Alarm monitoring with acknowledgement
- Graphical display of offline trend data (trendlog objects) as well as export to Microsoft Excel for further processing
- Favorites for the most important plant data
- Log on and off via Desigo user profile with multistage access protection
- Plant overview of the most important plant values, even without log on
- Support of additional clients via standard Web browser (HTML5 technology) on various hardware platforms (e.g. tablets, notebooks/PCs, smartphones)
- Display automatically adjusts to the size of the given client

Type overview

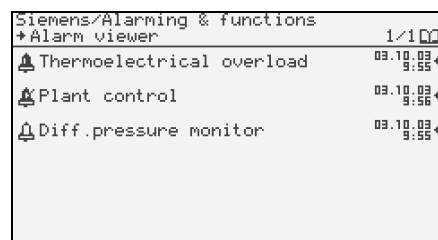
PXM40	Desigo touch panel with 10-inch screen diagonal
PXM50	Desigo touch panel with 15-inch screen diagonal
PXG3.W100	Web interface BACnet/IP

Network operator units PXM20

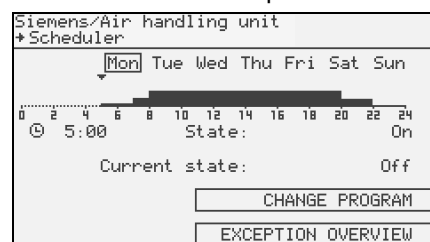
The PXM20 and PXM20-E network-compatible operator units allow full operation of all Desigo PX automation stations connected to a BACnet network. The operator unit has a high-resolution backlit display for graphics and text, buttons for operation, and a common alarm indicator with an audible signal. The operator unit can be mounted remotely for compact and modular automation stations in the control panel door.



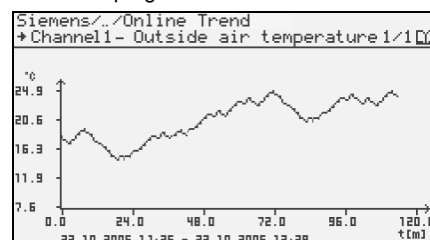
Operator unit PXM20



Alarm overview



Scheduler program



Online trend

PXM20/PXM20-E operating functions

- Alarm monitoring with acknowledgement and visual and audible alarm indication
- Data point display and operation of all actual values and setpoints, plant states, operating states and parameters
- Graphics-based display and operation of schedules, exception calendar, online trend and heating curve
- User-friendly guidance through the plant functions
- Favorites, configurable overview of main values in the plant
- Multilevel access protection
- Can be exchanged during operation

Type summary

PXM20	Operator unit for Desigo PX automation level, communication via LonTalk
PXM20-E	Operator unit for Desigo PX automation level, communication via IP

Plant operator unit PXM10

The PXM10 operator unit allows full local operation of a Desigo PX automation station. The unit incorporates user-friendly single-button operation and a high-quality display. It can be mounted in the control panel door.



Operator unit PXM10

Actual values		⌘
Outside ai	21.4 °C	
Supply air	31.9 °C	
Room tempe	10.6 °C	

Display of setpoints and actual values

PXM10 operator functions

- Display of measured values, setpoints, plant states and operating states
- Setpoint readjustment where required
- Visual alarm display
- Alarm display with acknowledgement
- Graphics-based display of scheduler program

Operator units/sensors QAX...

Up to five bus-capable QAX... operator units/sensors can be connected to the compact automation station PPS bus, allowing building users to match comfort values to individual needs.



QAX30.1



QAX31.1



QAX32.1



QAX33.1



QAX34.1



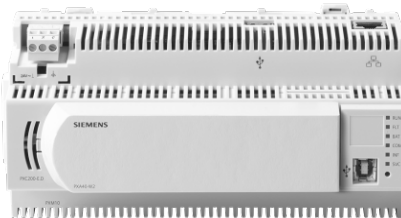
QAX84.1/PPS2²⁾

Function overview	QAX30.1 QAX90.1 ¹⁾	QAX31.1 QAX91.1 ¹⁾	QAX32.1	QAX33.1	QAX34.1 QAX34.3 ³⁾	QAX84.1/ PPS2 ²⁾
Temperature sensor	•	•	•	•	•	•
Setpoint readjustment		•	•	•	•	•
Operating mode selector			•	•	•	•
Fan speed selector				•	•	•
LCD for temperature, setpoint readjustment and operating mode					•	•
¹⁾ Wireless room units ²⁾ Flush-mounted room unit ³⁾ One device per PXC...						

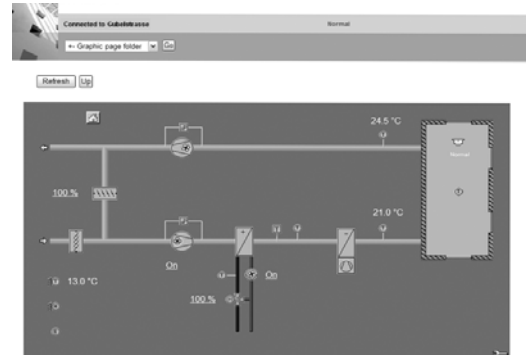
PX-Web operation

With its integrated Internet technology, the embedded Web server allows full plant operation of the Desigo PX automation station using standard Web browsers.

The Web server is integrated in the automation station of modular series PXC00/50/100/200-E.D via option module PXA40-W..



PXC00/50/100/200-E.D with plugged-in option module PXA40-W..



Operation and monitoring via Web client

Main functions of PX-Web

- Operation via Web browser or mobile clients (mobile phone, PocketPC or PDA)
- Simple plug-and-play functions, no engineering needed
- User-friendly guidance through plant functions
- Full access to all measured values, setpoints, plant and operating states plus parameters
- Comprehensive data point operation and setpoint entry using clear text
- Alarm management via SMS (to specified telephone number) or by e-mail
- Operation of schedules, exception calendar and heating curve graphs
- Graphical display of offline trend data (Trendlog objects) and export to Microsoft Excel (Trendlog and Trendlog Multiple objects) for further evaluation
- Collation of main values via "Favorites"
- Support of multiple level access protection
- Additional graphics-based display of plant – easy to create and modify
- Modem and Ethernet version available

Connected to Gubelstrasse		Normal
+-- Air handling unit 1		
Refresh Up Page 1 of 1		
Set point for cooling	20.0 °C	?
Set point for heating	20.9 °C	?
Set point for heating demand	60.5 °C	?
Temperatur control	Off	?
Extract air temperature	21 °C	?

Plant operation

Connected to Gubelstrasse		Pending Alarms (1)
+-- Alarm viewer		
Refresh Up Page 1 of 1		
Frost protection monitor	24.02.2012	13:46:59
Fire detection door	24.02.2012	10:33:24
Fire detector corridor	24.02.2012	10:31:01

Alarm overview

PX-Web type summary

Modular series automation stations PXC...-E.D + PXA40-W1

Access with Web server via IP, alarms via SMS and e-mail, generic Web functions/operation on all connected Desigo PX automation stations with a BACnet network.

Modular series automation stations PXC...-E.D + PXA40-W0/W2

Access with Web server via IP, alarms via SMS and e-mail, graphical Web functions/operation on all connected automation stations (for PXA40-W0) or on all Desigo PX automation stations on one BACnet network (for PXA40-W2).

Freely programmable automation stations

Desigo PX offers maximum flexibility with freely programmable automation stations for primary plants. This way, building services plants can be optimally controlled and monitored. Comprehensive system functions such as alarms, time scheduling and trend data storage cover all the requirements associated with the operation of a building. The distributed automation stations, available in two categories, operate autonomously.

BACnet communication for maximum openness

Desigo PX is based on industry standards designed not only for present and future communications technologies. BACnet/IP, LonTalk or AMEV and LonTalk are not mere buzzwords to us. On the contrary, they emphasize the openness of the systems supplied by Siemens and usage of the latest communications technology for maximum overall efficiency. The consistent and coordinated use of standard technologies also ensures straightforward and cost-effective integration of third-party systems and components.

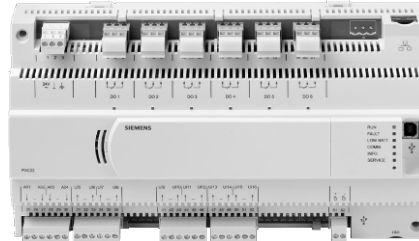


Freely programmable automation stations Desigo PX (PXC..D)

Automation stations – compact series

The mounting technique and the fixed configuration of integrated I/Os in the automation stations of the compact series make them ideal for the control of small and distributed plant. The I/Os in these automation stations can be adapted to various types of signal.

The automation stations are installed in the control panel. The operator units are connected to BACnet, via Web interface, the PPS bus, or to the HMI terminal.



Automation station PXC22-E.D

Overview of automation stations: Compact series			
BACnet/LonTalk	PXC12.D	PXC22.D	PXC36.D
BACnet/IP	PXC12-E.D	PXC22-E.D	PXC36-E.D
I/Os	12	22	36
UIO	8	16	24
DI	2	0	4
DO	2	6	8

Input and output options	
UIO	<p>Universal inputs that can be:</p> <ul style="list-style-type: none"> Passive (LG-Ni1000 sensor) and active sensing elements (DC 0...10 V signal) With binary, potential-free contacts for signaling functions Or counters as an alternative (20 Hz) <p>Analog outputs</p> <ul style="list-style-type: none"> To drive DC 0...10 V actuators Some of the UIOs can also be programmed as binary switching function and handle switched loads of 24 V/20mA via the program structure: For PXC12/22..D: 4 UIO, and PXC36: 6 UIO
DI	Binary inputs for signaling functions
DO	AC 230 V/2 A relay outputs for binary control

Up to 5 QAX3... operator units/sensors can be connected to any of the automation stations of the compact series.

Automation stations – modular series

The modular PXC..D automation stations with their free I/O configuration and DIN compliant construction are optimized for panel mounting. They control and monitor primarily larger items of plant. The flexible TX-I/O modular product range for signaling, measuring, metering, switching and positioning can be seamlessly connect to the automation station.

The I/O modules with local manual controls on the module housing provide the plant operator with simple manual operation of the plant directly in the control panel. This local manual control is automatically transmitted as a remote/local signal to the automation station and associated operator units. In an emergency, they operate independently of the automation station, providing standalone emergency operation.

The automation stations can be extended as needed by means of extension and I/O modules via interfaces to integrate devices featuring different communication protocols such as LONWORKS, Modbus, M-bus, etc.



PXC50/100/200..D modular automation station with connected TX-I/O modules

Overview of automation stations – modular series

BACnet/LonTalk	PXC50.D	PXC100.D	PXC200.D
BACnet/IP	PXC50-E.D	PXC100-E.D	PXC200-E.D
Number of data points ¹⁾	Up to 52	Up to 200	Over 200

1) TX-I/O module connections via island bus or PTM-I/O modules via extension module PXX-PBUS

The PXC...D automation stations of the modular series comprise LONWORKS system controllers to efficiently connect LONWORKS devices such as Desigo RXC room controllers and third-party devices.

Overview of automation stations LONWORKS

PXC00.D¹⁾	Automation station with BACnet/LonTalk communication
PXC00-E.D¹⁾	Automation station with BACnet/IP communication

1) Dedicated for LONWORKS devices

The PXC..D automation stations of the modular series are supplemented with option and extension modules.



Plug-in option module PXA40-...
for modular series PXC..D



Side-connection extension module
PXX.. for modular series PXC..D

The option modules for the automation stations assume additional functions such as PX-Web or remote management together with Desigo Insight.

Overview of option modules for modular series PXC...0.D (BACnet/LonTalk)	
PXA40-T	Option module for remote management

Overview of option modules for modular series PXC...0-E.D (BACnet/IP)	
PXA40-T	Option module for remote management
PXA40-W0	PX-Web option module for IP, remote management, SMS, e-mail ¹⁾ and alarming with graphics-based Web functions ¹⁾ for the automation station fitted with the module
PXA40-W1	PX-Web option module for IP, remote management, SMS e-mail ¹⁾ and alarming with graphics-based Web functions ¹⁾ for all automation stations connected to a BACnet network
PXA40-W2	PX-Web extension module for IP, remote management, SMS e-mail ¹⁾ and alarming with graphics-based Web functions ¹⁾ for all automation stations connected to a BACnet network

1) One communication type only: Either Designo Insight PTP or Web PPP

Extension modules PXX-L.. allow for flexibly connecting LONWORKS devices such as Designo RXC room controllers and third-party devices to modular series PXC...D to supplement room automation with functions for grouping, scheduling, trend, alarm management, and data point mapping both to BACnet/IP and BACnet/LonTalk.

Overview of extension modules PXX-L..	
PXX-L11	Extension module for up to 60 ¹⁾ LONWORKS devices/RXC room controllers
PXX-L12	Extension module for up to 120 ¹⁾ LONWORKS devices/RXC room controllers

1) For PXC00...D. When combined with PXC100/200...D and concurrent use of I/O modules, the number of devices/controllers is reduced in relation to capacity. For PXC50...D, 10 devices/controllers are permitted

The PXX-PBUS extension module allows connecting installed PTM-I/O modules to PXC50/100/200...D automation stations, rendering them the perfect solution to migrate the legacy systems Visonik and Unigyr. In addition, parallel connection of further TX-I/O modules to the same automation station is easily possible.

Extension module PXX-PBUS to integrate PTM-I/O modules	
<ul style="list-style-type: none"> - Together with PXC50...D: Up to 52¹⁾ I/Os - Together with PXC100...D: Up to 200¹⁾ I/Os - Together with PXC200...D: Up to 350¹⁾ I/Os 	

1) Including TX-I/O data points

Desigo TX-I/O modules

Desigo TX-I/O modules provide the interface to the devices at the field level, the sensors and actuators as well as to shading (blinds) and lighting. They communicate with connected Desigo PX modular automation stations or Desigo TRA room automation stations and can be interconnected in application-specific configurations.

A space-saving, flexible product range of compact TX-I/O modules is available for signaling, measuring, metering, switching and positioning. The I/O module system is DIN compliant in design and optimized for panel mounting and supports decentralized, remote module installations.

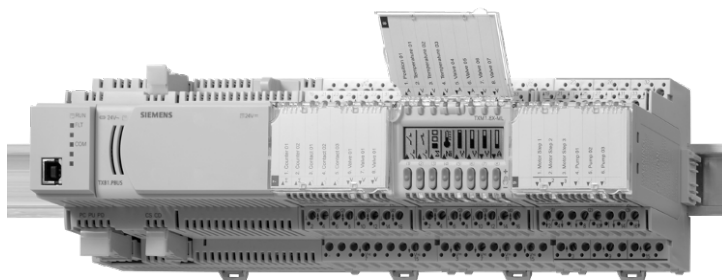
The TX-I/O modules have LEDs or optional LCDs with signal and warning display programs to indicate the state of the plant and facilitate manual or emergency operation depending on the type of module.

The integrated isolating terminal strip allows hardware testing during commissioning.

The combination of Desigo TX-I/O modules with proven PTM modules within a plant is also possible.

For the user, the advantages offered by the Desigo TX-I/O modules are the following:

- Integrated isolating terminal strip
- Integrated manual controls (optional)
- Integrated diagnostics functions with LED and optional LCD
- Optimized for HVAC actuators and sensors plus shading and lighting
- DIN compliant construction optimized for panel mounting
- Self-establishing bus connection for straightforward mounting
- Lean, flexible product range for optimized logistics
- Clear-text module labeling
- Tool support for configuration, diagnostics and function test
- Third-party integration with Desigo TX Open modules for Modbus, M-bus meters and variable speed drives (Siemens G120P)



Desigo TX-I/O modules with integrated isolating terminal strip and optional manual operation

I/O modules via Desigo PX allow for integration of third-party products such as pumps (Grundfos or Wilo), compact air conditioning units (MENERGA), M-bus meters, and variable speed drives in a decentralized and economic manner. Access to the following information is available when pumps are connected:

- Control of operating mode
- Setpoint readjustments
- Fault and status codes
- Pump head
- Power
- Speed

Overview of TX-I/O modules

Product type	TXM1.8D	TXM1.16D	TXM1.8U	TXM1.8U-ML	TXM1.8X	TXM1.8X-ML	TXM1.6R	TXM1.6R-M	TXM1.8P	TXM1.6RL	TXM1.8RB	TXM1.8T
Max. inputs/outputs	8	16	8	8	8	8	6	6	8	6	8	8
Application												
Primary plants Desigo PX	•	•	•	•	•	•	•	•	•	•	-	•
Room automation Desigo TRA	•	•	•	-	-	-	•	-	-	•	•	•
Functionality												
Local override	-	-	-	•	-	•	-	•	-	-	-	-
LCD	-	-	-	•	-	•	-	-	-	-	-	-
3-color I/O status LED	•	-	-	-	-	-	-	•	-	-	-	-
Green I/O status LED	-	•	•	•	•	•	•	-	•	•	•	•
Digital inputs (DI)												
Status signal (NC/NO)	•	•	•	•	•	•	-	-	-	-	-	-
Status pulse	•	•	•	•	•	•	-	-	-	-	-	-
Counter 10 Hz (with bounce suppression)	•	1...8 ¹⁾	-	-	-	-	-	-	-	-	-	-
Counter 25 Hz (bounce-free)	-	-	•	•	•	•	-	-	-	-	-	-
Analog inputs (AI)												
LG-Ni1000	-	-	•	•	•	•	-	-	•	-	-	-
Pt1000/0...2500 Ohm	-	-	•	•	•	•	-	-	•	-	-	-
T1	-	-	•	•	•	•	-	-	-	-	-	-
DC 0...10 V	-	-	•	•	•	•	-	-	0...250 Ohm	-	-	-
4...20 mA/0...20 mA	-	-	-	-	•	•	-	-	Pt100 4-wire	-	-	-
Analog outputs (AO)												
DC 0...10 V	-	-	•	•	•	•	-	-	-	-	-	-
4...20 mA	-	-	-	-	5...8 ¹⁾	5...8 ¹⁾	-	-	-	-	-	-
Digital outputs (DO)												
Maintained contact On/Off	-	-	-	-	-	-	•	•	-	-	-	-
Maintained contact 3-stage	-	-	-	-	-	-	•	•	-	-	-	-
3-position output	-	-	-	-	-	-	•	•	-	-	-	-
Pulse On/Off, 3-stage	-	-	-	-	-	-	•	•	-	-	-	-
Multistate	-	-	-	-	-	-	•	•	-	-	-	-
Triac maintained contact	-	-	-	-	-	-	-	-	-	-	-	•
Triac pulse (3-stage)	-	-	-	-	-	-	-	-	-	-	-	•
Triac PWM	-	-	-	-	-	-	-	-	-	-	-	•
Shading control (blinds)	-	-	-	-	-	-	-	-	-	-	•	-
Lighting control (bistable)	-	-	-	-	-	-	-	-	-	•	-	-

1) Implementation on these I/O data points

Room automation with Desigo

Two product ranges are available for room automation.

Desigo TRA

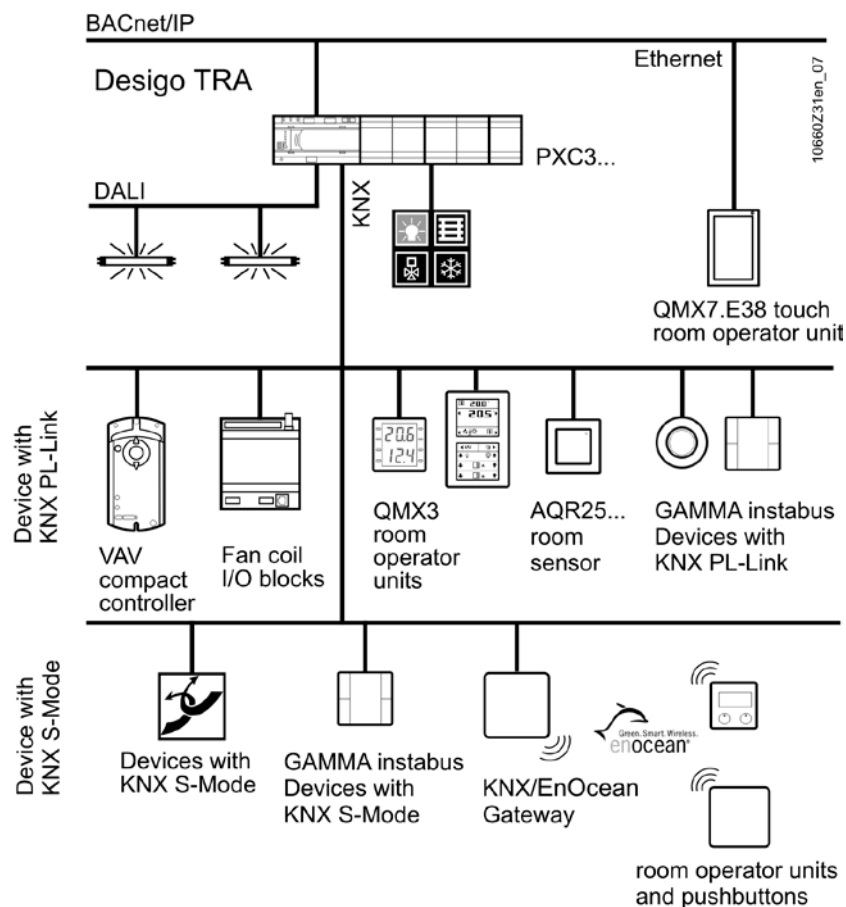
Desigo TRA (Total Room Automation) is used in buildings with multiple disciplines for room automation (HVAC, lighting, blinds) all combined in one total solution. Desigo TRA offers solutions with greater functionality and flexibility, allowing for energy-optimized plant operation without loss of comfort (energy performance class A as per EN 15232). The programmable room automation stations PXC3 communicate via BACnet/IP and offer integrated interfaces to the PL-Link bus for plug-and-play field devices as well as to KNX and the DALI bus as an option.

Desigo RX

Desigo RX is a proven room automation product range featuring comprehensive communication and application functions for individual rooms. The product range consists of three lines of communicating room controllers (RXC, RXB, and RXL) with operator units and predefined applications for HVAC, lighting, and blinds. LONWORKS or KNX network connection of the controllers to the system via the system controllers provides additional functionality.

Desigo TRA (Total Room Automation)

New guidelines to save energy, lower operating costs and more demanding requirements placed on comfort and design call for more sophisticated interaction of the various technical installations in buildings. The modular PXC3 room automation stations of Desigo TRA group lighting, shading and HVAC in one single, comprehensive solution. They are connected to the Desigo PX automation stations of the primary plants via BACnet/IP.



The PXC3 room automation stations with integrated KNX connection permit the direct integration of both devices with KNX PL-Link as well as KNX S-Mode in Desigo TRA.

KNX PL-Link meets in full the KNX standard. Communication between the PXC3 room automation stations and field devices with KNX PL-Link is optimized within the framework of the KNX standard to automatically recognize devices as part of the plug-and-play function. Desigo Tools parameterize the KNX PL-Link. KNX commissioning software (ETS) is not required. A wide selection of Siemens field devices, including room operator units, buttons, motion detectors, or VAV compact controllers support KNX PL-Link.

Desigo TRA is the perfect room solution by supporting DALI and EnOcean devices also.

Costs to extend or change the use of rooms are a key factor in a building's life-cycle. A flat system architecture and one single tool for all disciplines in a building allow for fast and easy extensions or changes.

The PXC3 room automation station is programmable based on proven application blocks. Solutions tailored to specific needs achieve maximum efficiency and comfort. A comprehensive block library for room automation is provided as part the scope of delivery of Desigo V5. The library contains predefined application functions for room climate, lighting, shading, and superimposed room functions. They can be combined to form individual solutions together with operating and display functions. The individual application functions can be adapted to customer needs and are freely programmable. See also chapter "Proven application solutions".

The application functions do not depend on the selected peripheral devices.

Room automation stations PXC3

The room automation stations of the PXC3 series can assume control for multiple rooms. They communicate with each other or other system components via BACnet/IP. The scope of the supported BACnet objects of the PXC3 series is aligned to room automation (BACnet B-ASC profile) and certified accordingly. The room automation stations have two Ethernet interfaces to allow for low-cost cabling via line topology (Daisy Chain).

TX-I/O modules connected directly to the PXC3 allow for direct connection of field devices. The KNX connection enables room units, sensors and actuating devices to communicate with the room automation station up to 500 m. Selected Siemens field devices support KNX PL-Link and can be connected as field devices per plug-and-play to the bus. Desigo Tools parameterize them; KNX commissioning software (ETS) is not required. Devices with KNX S-Mode can be integrated with the help of ETS commissioning software.

The DALI bus is used for lighting control. Commercially available DALI electronic ballasts and dimmers can be connected.

The room automation stations are capable of powering TX-I/O modules, PL-Link and DALI bus. With TX-I/O modules and KNX connection, separate supplies can be added as needed.



PXC3E.72, PXC3E.75
Modular room automation station without DALI



PXC3E.72A, PXC3E.75A
Modular room automation station with DALI

Overview of PXC3 room automation stations					
Product type	Functionality	BACnet/IP	KNX bus	TX-I/O modules	DALI bus
PXC3.E72	Typically 4 rooms, typically 8 room segments ¹	2 ports	Max. 64 devices	Max. 72 physical I/O points	-
PXC3.E72A	Typically 4 rooms, typically 8 room segments ¹	2 ports	Max. 64 devices	Max. 72 physical I/O points	Max. 64 ballasts*
PXC3.E75	Typically 8 rooms, typically 16 room segments ¹	2 ports	Max. 64 devices	Max. 200 physical I/O points	
PXC3.E75A	Typically 8 rooms, typically 16 room segments ¹	2 ports	Max. 64 devices	Max. 200 physical I/O points	Max. 64 ballasts*

¹ Architectural segmentation of a building (also referred to as room axes)

* Commercially available DALI ballasts with DALI address

Touch room operator unit QMX7.E38

The QMX7.E38 touch room operator unit offers a touch-sensitive 4.3-inch IPS color display with intuitive operating concept. The operating scope can be customized to customer demand. The operator units supports all Desigo TRA functions for room operation such as HVAC, lighting, and blinds as well as setting scenes.



Touch room operator unit QMX7.E38

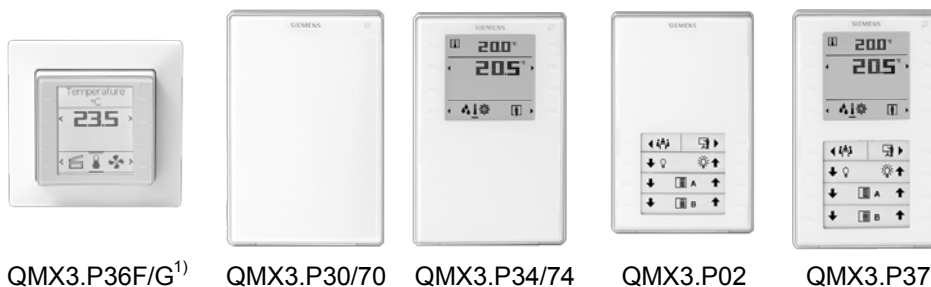
The operator unit is connected directly via Ethernet/IP cabling (RJ45). The device is supplied either via power over Ethernet (PoE) or AC 24 V. It can be used in landscape or portrait format and fits all common receptacles.

The room operator unit directly communicates via TCP/IP with the related PXC3 room automation station. Multiple QMX7.E38 can be connected to the same room automation station.

Thanks to its innovative operating and display concept, Desigo TRA actively connects the user to energy management. The RoomOptiControl energy efficiency function detects excessive energy consumption and indicates it on the QMX3.E38 or QMX3 room operator units by changing the color of the Green Leaf button symbol. Simply pressing the button returns room comfort to energy-optimized operation without sacrificing comfort. This allows for saving up to 25% of energy. See also "RoomOptiControl – saving energy in the room without compromising comfort".

Room operator units QMX3

Regardless of small or large office, conference rooms, hotel rooms or foyer, flexible QMX3 room operator units provide the user functionality matched precisely to need. You can create customized operating concepts ranging from measurement to comprehensive display and operation of room conditions, up to the control of lighting and shading.



1) Available with square or horizontal white front. Fully compatible with the DELTA design program as part of the GAMMA product range from Siemens

Function overview	QMX3.P36F QMX3.P36G	QMX3.P30	QMX3.P70	QMX3.P34	QMX3.P74	QMX3.P02	QMX3.P37
Mounting type	Flush-mount	Direct wall-mount (flush-mount not required)					
Green Leaf symbol for active energy management	•			•	•		•
Air quality indicator			• ²⁾	•	•		•
Display (LCD) including operation	•			•	•		•
Additional display/operation for lighting/shading						•	•
Temperature sensor	•	•	•	•	•	•	•
Air quality sensor (CO ₂)			•		•		
Humidity sensor			•		•		

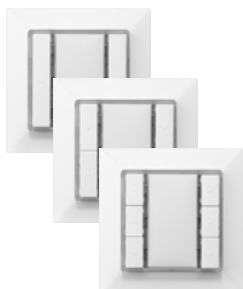
2) Multicolor LED (air quality indicator) in green, orange or red. Air quality can also be displayed directly on all LCDs as a value or symbol

The QMX3 room operator units also support all Desigo TRA functions for room operation including the Green Leaf display and acquisition of room conditions. The units communicate with PXC3 room automation stations via KNX PL-Link and – via plug-and-play – simplify engineering and commissioning. QMX3¹ can also be used in KNX S-Mode systems, with another functionality and commissioning using ETS.

1) Identical type designation with the exception of QMX3.P36F/G with the designation FM227

DELTA i-system switch programs and style with KNX PL-Link

The buttons of the two DELTA i-system and DELTA style programs of the GAMMA range support the KNX PL-Link bus with plug-and-play functionality for fast and easy commissioning in addition to KNX S-Mode communication.



DELTA i-system buttons

- Single, titanium white/aluminum-metallic
UP221 without LED, UP221E with LED
- Double, titanium white/aluminum-metallic
UP222 without LED, UP222E with LED
- 3 button pairs, titanium white/aluminum-metallic
UP223 with LED, UP223/5 with LED and IR reception
decoder for IR receivers S425/72 and AP42../13



DELTA style buttons

- Single, titanium white/aluminum-metallic
UP285/2 without LED, UP285/3 with LED
- Double, titanium white/aluminum-metallic
UP286/2 without LED, UP286/3 with LED
- Quadruple, titanium white/aluminum-metallic
UP287/2 without LED, UP287/3 with LED
UP287/5 with LED and IR reception decoder for IR
receivers S425/72 and AP42../13



Bus coupler UP117/11 for DELTA i-system and DELTA style buttons.

Button interface with KNX PL-Link

The UP220 button interface of the GAMMA range has four digital inputs to connect conventional lighting and blind buttons.

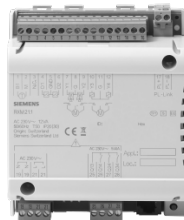


Button interface UP220/31

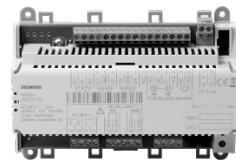
In addition to KNX S-Mode communication, the device KNX PL-Link with plug-and-play functionality for simple and time-saving connection to PXC3 series room automation stations.

Fan coil unit I/O blocks RXM with KNX PL-Link

I/O blocks RXM21.1 and RXM39.1 include an I/O mix for low-cost integration of fan coils. They support KNX PL-Link with plug-and-play functionality. The actual control function resides on the room automation station.



RXM21.1 for three-speed fans and AC 24 V motorized or thermal valve actuators



RXM39.1 for EC/DC fans and DC 0...10 V valve actuators

Sensors and actuators with KNX PL-Link

Presence detector UP258 with brightness sensor of the GAMMA range is suited for constant light control as well as a receiver for IR remote control S255/11.

In addition to KNX S-Mode communication, the device supports KNX PL-Link with plug-and-play functionality for simple and time-saving connection to PXC3 series room automation stations.

As of Designo V5.1, the communicating flush-mount room sensors AQR257.. and AQR253.. can be integrated via KNX PL-Link in Designo TRA. The room sensors acquire room temperature, relative humidity and air quality (CO₂) in the room.

Similar to the QMX3.P70 room unit, air quality is signaled to the room occupant using a multicolor LED.



Presence detector with brightness sensor
5WG12582DB11



Communicating flush-mount room sensors
AQR257.. and AQR253..

An additional passive temperature sensor can be connected to acquire another temperature. Binary inputs of the room sensor recognize the state of up to two connectable, potential-free contacts and can therefore be used to operate lighting and shading.

The room sensors consist of a front and a base module and can be combined as needed for each measured variable. They fit seamlessly in the design program DELTA of the GAMMA product range from Siemens. Also, they support all common international flush mount formats.

GDB181.1E/KN and GLB181.1E/KN are two networkable VAV compact controllers that communicate directly with the PXC3 room automation station.



GDB181.1E/KN (AC 24 V/5 Nm)
GLB181.1E/KN (AC 24 V/10 Nm)

In addition to KNX S-Mode communication, these devices support KNX PL-Link with plug-and-play functionality for simple and time-saving connection to PXC3 series room automation stations.

Wireless and self-powered EnOcean room units

The wireless and self-powered EnOcean room units can be connected to the PL-Link bus via the EnOcean/KNX gateway (requires ETS engineering).



- QAX95.4: Room unit with temperature sensor
- QAX96.4: Room unit with temperature sensor and setpoint readjustment
- QAX97.4: Room unit with temperature sensor, freely configurable button, setpoint readjustment, and switch (2 speeds)
- QAX98.4: Room unit with temperature sensor, freely configurable button, setpoint readjustment, and switch (5 speeds)

These devices can also be used with Desigo RX via EnOcean/LONWORKS or EnOcean/KNX gateway.

Convenient room automation with Desigo RX



Desigo RX is a modern, flexible range of room controllers and room units suitable for both standalone operation and communication over a network. The room controllers control and monitor comfort conditions in rooms and self-contained zones while ensuring maximum energy efficiency. They have indicated outstanding performance during the eu.bac certification of the RXC, RXB and RXL devices.

The Desigo RX range comprises compact and modular controllers, easy-to-operate QAX room units and RX controllers in room-style housings.

The right solution for every network

The Desigo RXB and Desigo RXC families of controllers represent a lasting investment in the future.

The Desigo RXC room controllers communicate via the standardized LONWORKS protocol, and the Desigo RXB room controllers via KNX S-Mode (EIB). The use of these communication standards allows Desigo RX to be combined with other third-party devices. This ensures that room automation can be easily extended or adapted for change of use.







The RXL family completes the range with an economical room solution. These room controllers use a Desigo-specific bus for communication.

The RX controllers can be operated autonomously or integrated seamlessly in the Desigo system. This opens up additional building automation options.



Integrated operation of HVAC, lighting and blinds with Desigo RXC

Product range overview – Desigo RX

	Communicating (RXL, RXB, RXC)				
	Desigo-specific	KNX	LONWORKS		
Lighting and blinds					
VAV					
Radiator and chilled ceiling					
Fan coil unit					
Product type	<ul style="list-style-type: none"> ▪ RXL21 ▪ RXL22 ▪ RXL24 ▪ RXL39 	<ul style="list-style-type: none"> ▪ RXB21 ▪ RXB22 ▪ RXB24 ▪ RXB39 	<ul style="list-style-type: none"> ▪ RXC32* ▪ RXC20 ▪ RXC21 ▪ RXC22 ▪ RXC39 	<ul style="list-style-type: none"> ▪ RXC10 	<ul style="list-style-type: none"> ▪ RXC31 ▪ RXC40 ▪ RXC41

* RXC32.1 not available in Germany

Product range overview – Desigo RXC

Desigo RXC is a comprehensive range of room controllers for HVAC automation, extension modules for lighting and blinds, and a graded range of tailored room units. Each room controller carries downloadable application software (referred to as the "application") with optimized control programs for the respective room or area. Siemens Building Technologies maintains a comprehensive library of reliable and proven applications for HVAC and electrical applications.

Product range overview – Desigo RXB

The Desigo RXB devices are certified by the KNX Association and are put into operation with the ETS engineering and commissioning tool. The range consists of compact controllers, controllers in a room-style housing and room units for HVAC operation. Each Desigo RXB room controller is loaded with HVAC application software which includes one or more applications. The desired application can be enabled during commissioning. The compact RXB21.1, RXB22.1, and RXB39.1 room controllers are optimized for fan coil unit applications. The RXB24.1 room controllers are designed for radiator and chilled ceiling applications. They can be installed directly in the fan coil unit, in control panels or on ducting. They also communicate with the Synco 700 control system.

Product range overview – Desigo RXL





Desigo RXL is a range of economical room solutions. Data communication operates on a Desigo-specific bus which facilitates the change to BACnet. Additional functions include time scheduling, trend, heating/cooling demand, central control of setpoints and a host of other features.

Commissioning and parameterization are carried out directly on the controller using the Synco Tool ACS or the QAX34.3 room operator unit. Network connection is not required. The service LED shows the operating state of the room controller at all times. The range consists of compact controllers and QAX3..., QAX8..., and QAX9... room units for the HVAC sector. The compact RXL21.1, RXL22.1, and RXL39.1 room controllers are loaded with comprehensive standard applications for fan coil units. The required application is enabled during commissioning.

Each Desigo RXL room controller is loaded with HVAC application software which includes one or more applications. The desired application can be enabled during commissioning. The RXL24.1 room controllers are designed for radiator and chilled ceiling applications. They can be installed directly in the fan coil unit, in control panels or on ducting. They also communicate with the Synco 700 control system.

Room operator unit: The key to individual comfort

The Desigo QAX.. room operator units cover a wide spectrum of possible operating scenarios. They acquire the room temperature and allow setpoint readjustments, operating mode selection or fan speed control and have an LCD. The QAX9.. room units are wireless devices. Design and ergonomic operation are optimized.

	PPS2 (RXC, RXB, RXL, RXA, PX)			LONWORKS (RXC)
	Standard	Flush mounting	Wireless	Flexible
Lighting and blinds				
HVAC				
Product type	<ul style="list-style-type: none">▪ QAX30▪ QAX31▪ QAX32	<ul style="list-style-type: none">▪ QAX33▪ QAX34.1▪ QAX34.3▪ QAX39	<ul style="list-style-type: none">▪ QAX84/PPS2	<ul style="list-style-type: none">▪ QAX90▪ QAX91▪ QAX95*▪ QAX96*▪ QAX97*▪ QAX98* <ul style="list-style-type: none">▪ QAX50▪ QAX51

* Based on EnOcean for RXC and RXB

The QAX84.1/PPS2 room operator unit is based on the QAX34.1 (software and LCD are identical) and are installed flush mounted as a variant. This means that the device can also be combined with third-party switching programs.

With RXB, the room operator units QMX3.P34/37/74 (cp. page 42) can be used also (KNX S-Mode). QMX3.P37 allows for operating HVAC and/or lighting/blinds in one unit.

The QAX5...integrated room unit works with LONWORKS and combines the operation of HVAC, lighting and blinds in a single device. The keypad can be configured with the combination of buttons best suited for the application.

Applications

The proven applications make Desigo RX highly versatile. An extensive range of standard applications is available for fan coil units, VAV, radiators, and chilled ceilings.

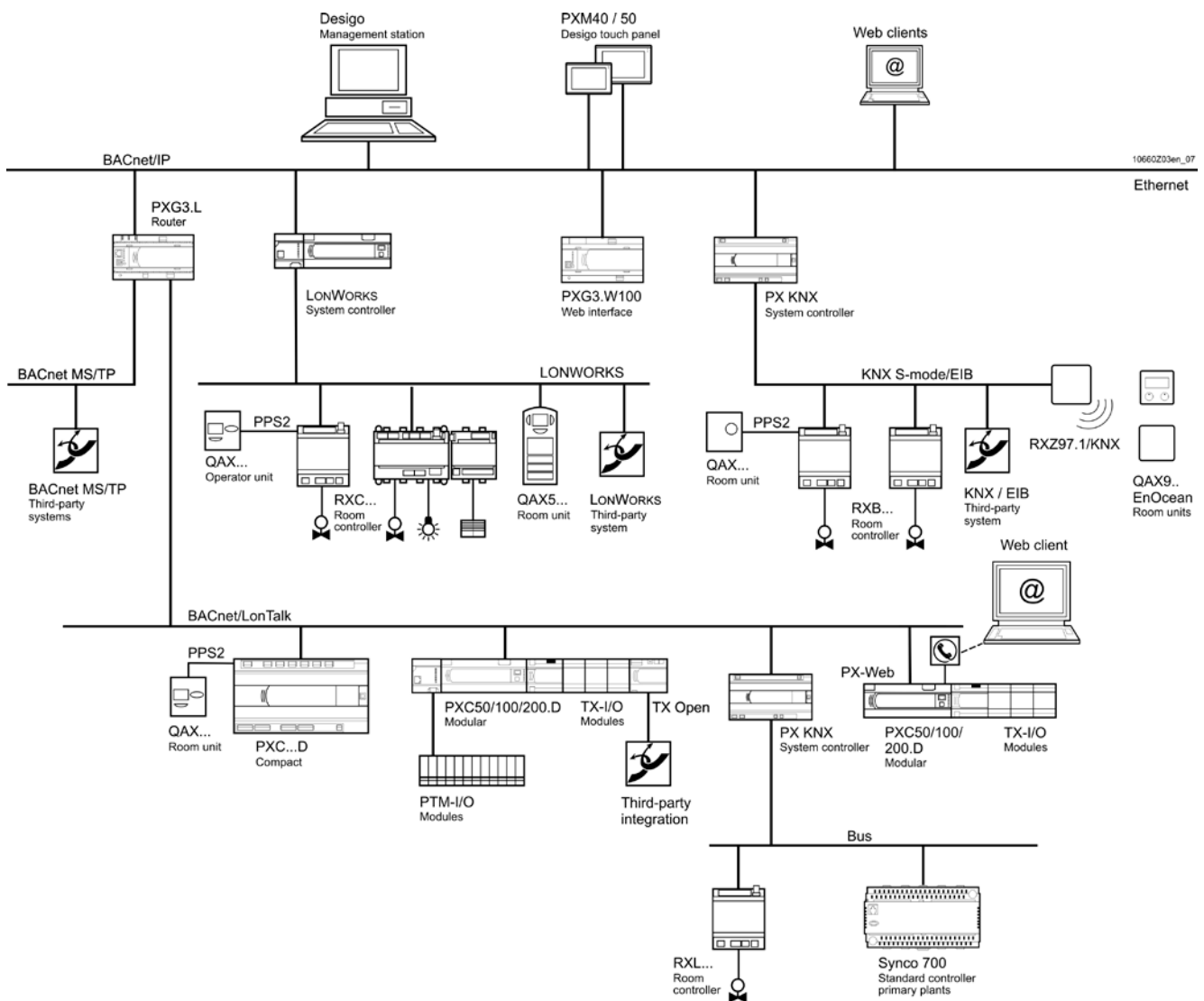
The control parameters are matched to the relevant room at the commissioning stage.

Autonomous operation of room automation

The room automation system performs its control tasks and communicates autonomously over the LONWORKS bus or KNX S-Mode bus (EIB).

Further, with Desigo RXL, a range of communicating room controllers with a Desigo-specific bus is now available.

Connection to BACS



Desigo RX topology

Connection to the automation level

Freely programmable automation stations and system controllers with a LONWORKS or KNX interface connect the Desigo RX room automation system to BACS, at the same time making other functions available:

- Conversion of LONMARK or KNX objects to BACnet objects
- Interface to BACnet for networks with RXL room controllers
- Concentration and simple operation of room data
- Grouping for optimization across rooms
- System functions and optimizer software such as schedules, trends, monitoring of alarms, etc.
- Coordination with the primary plant
- Safety functions, e.g. in the event of storm warnings

The automation level ensures that all data and functions of the room automation system can also be viewed and operated at the management level.

Control and operation of the RX devices with Desigo Insight opens the way to a range of additional functions including the following:

- Operation and monitoring of rooms via plant graphics
- Logging and archiving trend data
- Individual schedules
- Central control and overriding of setpoints, operating states, lighting, blinds, etc.

Designo Open

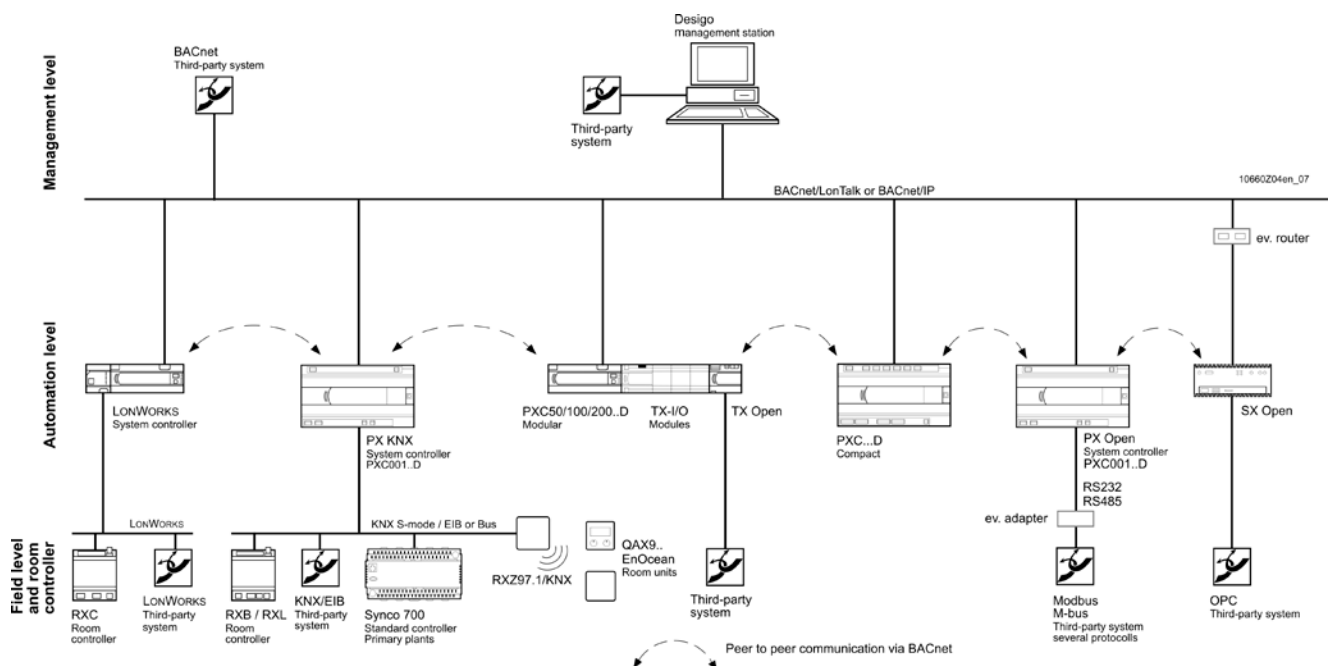
Designo Open is a consistent and open communication – simple technical connection of the widest possible range of building systems based on open and standardized data interfaces. Designo Open offers a portfolio of solutions for simple and cost-effective integration of third-party systems and devices.

These quality solutions have the following outstanding project-specific and user-specific features:

Features

- Management functions across system boundaries
- Uniform user interface
- Full integration of third-party systems into building automation
- Use of recognized standard communication protocols and powerful standard integration platforms
- Extension and replacement of individual components at any time
- Optimum cost-benefit ratio for operation and maintenance
- Technical support throughout the entire project cycle for long-term investment protection

Designo Open provides optimum integration of third-party system at each level, depending on the required process interaction and the number of data points.



Designo Open topology

Thanks to its open communication, Designo facilitates easy technical integration of a multitude of building services systems. See also "Communication – networks".

Desigo Insight Open

SCADA technology

Insight Open is an advanced integration platform for direct connection to the management level which uses vendor-neutral visualization systems based on SCADA technology. SCADA (Supervisory Control and Data Acquisition) systems are software products from the field of industrial automation, and can be used to connect various automation systems using a variety of device drivers.

SCADA technology is ideal for connecting standalone third-party systems or open automation and field buses, where the emphasis is placed on operation and monitoring, and where a reliable interconnection across all disciplines is not required. Vertical connections are implemented with communication cards or system-specific interfaces plugged directly into a management system PC. Insight Open makes use of the technological potential of Citect, a leading SCADA system supplied by Schneider Electric SA, France.

Insight Open is a supplement to the Desigo Insight management station and provides the following functions for the integrated third-party system or device:

Functions in Insight Open

- | | |
|---|---|
| • Graphical operation of plant and process | • Topological data point operation in Object Viewer |
| • Alarm display and operation | • Log book and message archiving |
| • Dynamic trend curves and long-term data storage | • Alarm routing to message receivers |
| | • Access protection |

Insight Open provides an OPC client (OLE for process control) for the connection of third-party systems. This supports the specifications of Data Access Version 1.0a and Version 2.0.

Hence, Insight Open is an integral component of the process control system and subject to the same high expectations in respect of reliability and minimum downtime.

The process values transferred from third-party systems to the Desigo Insight management station are mapped as SCADA process variables, or "variable tags". Special tags are used for alarm and trend variables:

- Alarm tag, alarm process variable
- Trend tag, trend process variable

Unlike the data points in BACS, the process variables (tags) each contain one item of information only. Alarms and trend logs are SCADA objects which are generated by and calculated in the I/O server.

Vendor-neutral protocols

- BACnet
- LONWORKS
- KNX S-Mode (EIB)

Vendor-specific protocols, e.g.:

- SIPOINT NT (access control)
- AlgoRex (fire detection system)

Desigo SX Open

SX Open is an innovative integration platform used to connect OPC-based third-party systems to an open BACnet network. Desigo SX Open forms a powerful link between OPC and BACnet by replicating an OPC client in OPC, and a BACnet server on BACnet.

The functions extend far beyond the simple mapping and transfer of OPC items to BACnet. For example, the freely programmable level of SX Open, at which functions can be interconnected, allows the following:

- Direct mapping of OPC items to BACnet objects, for display and operation by BACnet clients
- Grouping OPC items to create standard integrated BACnet objects
- Event-driven transfer of alarms in the BACnet network
- Trend server with its own data maintenance for Trendlog objects
- Peer-to-peer communication with other BACnet servers

SX Open is especially suitable for the integration of OPC-based third-party systems where there is a need to interconnect functions locally (peer-to-peer communication). It fully compensates for the disadvantages of simple SCADA technology.

The modular software package can be run on standard PC systems with Windows operating systems. Industrial control panel PCs with no rotating parts (e.g. Siemens micro box) offer reliability, easy maintenance and minimal downtime.

Features

- BACnet server to ANSI/ASHRAE 135-2004 with BACnet/IP
- Supported data objects: Analog Input and Output, Binary Input and Output, Analog and Binary Value, Multistate Input, Output and Value, Device, Notification Class, Schedule, Calendar
- Read and write access in accordance with BACnet rules of priority
- OPC Client Data Access V2.x and V3.0

Vendor-neutral protocols

- OPC server with data access for:
LONWORKS
KNX S-Mode (EIB)
M-bus
Modbus
PROFIBUS

Vendor-specific protocols, e.g.:

- OPC server with data access for third-party systems (e.g. fire detection, intrusion detection, access control, CCTV, industrial PLCs, and others)

Desigo PX Open

The native BACnet automation station PX Open is a multifunctional integration platform used to connect third-party automation stations and open field-bus networks to the BACnet network.

- PX LON for the connection of LONWORKS devices and networks and the Desigo RXC room automation system
- PX Modbus, PX M-bus and PX SCL (Structured Control Language) to connect Modbus, M-bus or simple ASCII protocols for RS232 or RS485 (free SCL programming)
- PX KNX to connect KNX S-Mode (EIB) devices and networks, Desigo RXB and RXL room automation as well as Synco 700

The data points of the third-party are mapped to input/output functions in BACnet and are then available as fully communicating data points for further processing and further connection, e.g. for:

- Alarm handling and prioritization
- Overriding, priority control and commands for central operation
- Grouping
- Scheduler programs
- Trend logging

PX Open integrates up to 2000 items of information per device. The bidirectional exchange of data is event-driven, i.e. the systems only exchange information if the data point changes. Peer-to-peer communication can be implemented without difficulty in the BACnet network.

The PX Open integration stations are positioned in a flexible configuration in the BACnet network and can be operated via the local LCD operator units.

"Simple" protocols based on ASCII strings can be connected directly to PX Open by use of SCL in conjunction with a freely programmable RS232 or RS485 port.

Vendor-neutral protocols	Vendor-specific protocols, e.g.:
<ul style="list-style-type: none">• BACnet• LONWORKS• KNX S-Mode (EIB)• M-bus• Modbus	<ul style="list-style-type: none">• Hotel management: Fidelio• Siemens AlgoRex (fire detection system)• Siemens room thermostats RDG/RDF/RDU

PX LON (to integrate LONWORKS networks)

PX LON connects LONWORKS networks to Desigo and maps LONWORKS network variables to BACnet data points.

Key functions of PX LON	
<ul style="list-style-type: none">• Compression of Desigo RXC room controller data and third-party devices• Maps Desigo RXC applications to BACnet for operation and monitoring (grouped as HVAC, lighting and blind control functions)	<ul style="list-style-type: none">• Superimposed control and optimization functions, such as room and zone-based groups, time control, and system functions such as changeover, summer/ winter compensation, etc.• Alarming, device monitoring• Trend storage

PX LON maps RXC applications in such a way as to produce a room view. This enables the rooms to be grouped together, for shared occupancy programs, or for shared commands for the control of lighting or blinds, for example.

PX M-bus

PX M-bus connects the M-bus consumption meters to the Desigo system and maps meter readings and device-related meter information to BACnet data points.

Key functions of PX M-bus

- Consumption data acquisition and remote monitoring of a maximum of 250 consumption and heat meters or up to 2,000 BACnet I/O objects
- Compression of data from consumption and heat meters at the automation level
- Alarming, device monitoring
- Trend storage to record meter readings

PX Modbus

PX Modbus connects Modbus devices or networks supporting the Modbus protocol as specified by Modicon to the Desigo system and maps their data points to BACnet data points. PX Modbus is particularly suitable for integrating industrial controls or chillers and linking them to the automation process.

PX KNX

PX KNX connects KNX S-Mode (EIB) networks to Desigo and maps KNX S-Mode (EIB) group addresses to BACnet data points.

Key functions of PX KNX

- Compression of data from the Desigo RXB room controllers and other KNX data points at the automation level
- Mapping of Desigo RXB and RXL as well as Siemens Synco 700 and other KNX S-Mode (EIB) applications to BACnet for operation and monitoring (grouped as HVAC, lighting and blind control functions)
- Superimposed control and optimization functions, such as room and zone-based groups, time control, and system functions such as changeover, summer/winter compensation, etc.
- Alarm handling, device monitoring
- Trend storage

Desigo TX Open

A few decentralized, distributed third-party devices can be connected quickly and cost-effectively via Desigo TX Open and processed in the automation system.

The microprocessor-based Open modules connect selected third-party devices via RS232 or RS485 to the decentralized I/O bus of the Desigo PX automation station. Various module types can be used depending on the communication protocol.

Manufacturer-specific protocols

- Modbus
- M-bus meters
- Variable speed drives: Siemens G120P
- Pumps: Grundfos, Wilo

Desigo tools

Software tools and a wide range of proven application blocks are available for engineering and handling the automation stations.

Desigo Xworks Plus

The engineering tool "Desigo Xworks Plus" provides user-friendly software tools. They are designed for technical processing of customer projects and comprise planning and configuration as well as commissioning and revision of automation stations and related programs. A variety of report functions are available for documentation purposes. Thanks to its intuitive design, Desigo Xworks Plus makes it easy to become familiar with the tool with no need for time-consuming training.

Different workflows are completely supported. Various processes are consistently supported depending on whether you are working with standardized Desigo application libraries or set up the program using data points.

Flexible programming

Moreover, Desigo Xworks Plus provides tools that – when used with the Desigo application library – allow flexible programming of individual solutions and facilitate parameterization and commissioning. The CFC Editor is used as a basis for this work. Comprehensive data exchange allows for decentralized work in the project by several user groups. Data only needs to be entered once and is always consistent. Functions for project management are available, such as creating and archiving projects as well as check in/out of project data for commissioning.



As a comprehensive engineering tool, Desigo Xworks Plus also establishes network topology, integrates third-party systems up to and including room automation systems. Desigo Xworks Plus supports the interaction with standard room automation LNS tools as well.

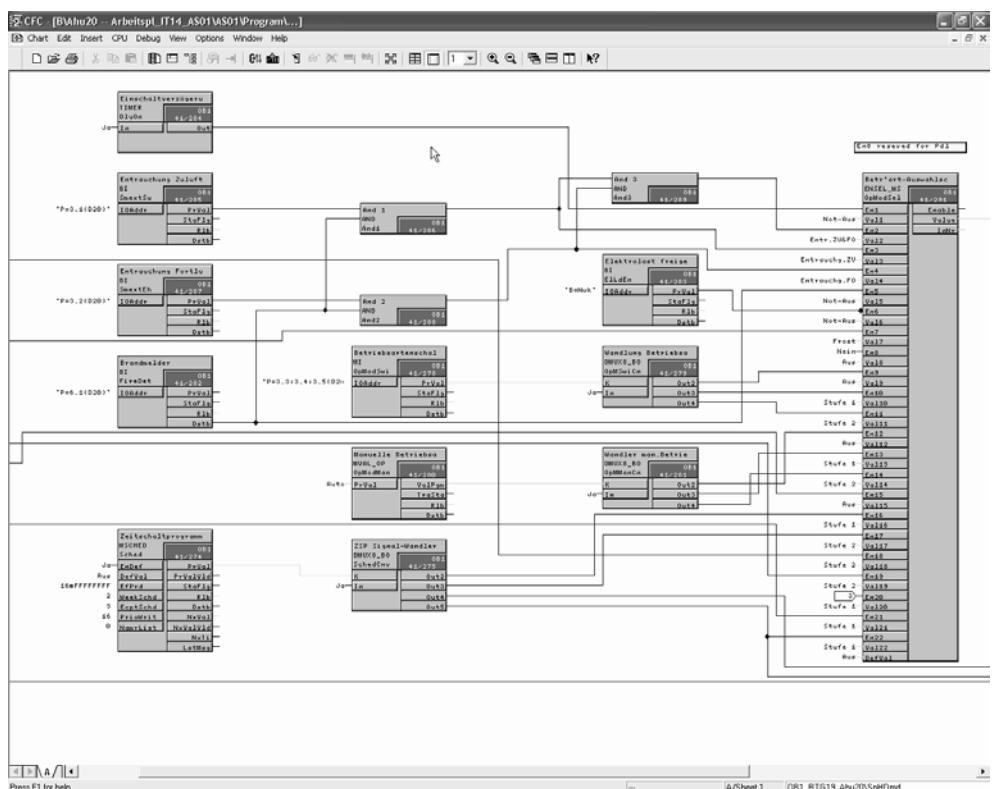
Electrical installers can carry out wiring and data point tests on the installed devices using the test tools tailored to their needs. The engineering tool provides the required data via the pack-and-go function and saves the test results to the automation station.

Programming with D-MAP

The D-MAP programming language (Designo Modular Application Programming) for Designo PX/TRA ensures efficient programming and parameter settings for the building systems. D-MAP is optimized for building services applications. The control strategies required for and best suited for efficient operation are implemented using graphics-based data flow programming.

Efficient engineering with blocks and compounds

The project-specific applications are configured, programmed, commissioned and maintained using the CFC Editor. The CFC Editor is a graphics editor based on block and data flow techniques. Predefined and tested application programs are assembled to create compound structures (referred to simply as "compounds"), and these are then made available in the libraries.



Creating the CFC chart with the CFC Editor

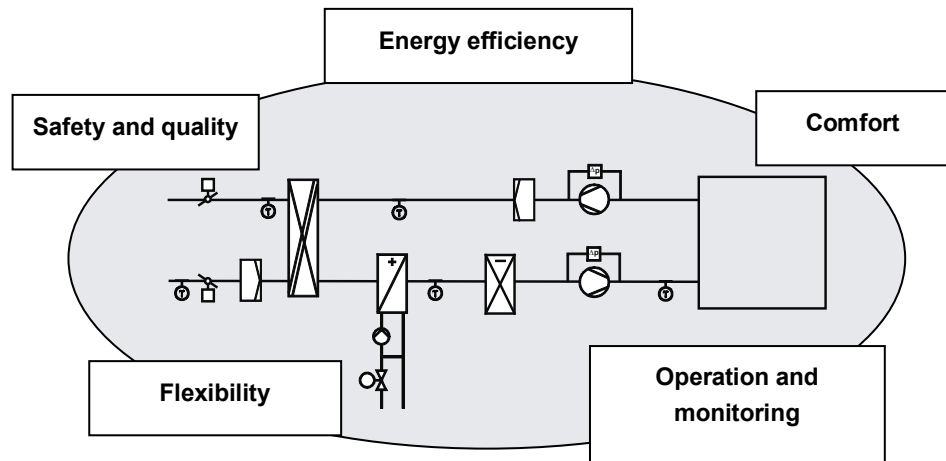
DMAP programming features

- The basic elements of D-MAP programming are blocks and "compounds" (compound functional units). These are stored in libraries
- To create a D-MAP program, the blocks and compounds for the required functions are put together in the CFC Editor. This process involves creating instances (of blocks) or copies (of compounds) from the libraries
- The flow of data between blocks is programmed by interconnecting the "pins" (inputs and outputs) of various blocks

Proven application solutions

The broad range of Desigo application libraries covers individual customer needs in a comprehensive manner. All available solutions contain images of actual plant, aggregates and components in a structure which can be used equally for engineering, control, operation, and monitoring.

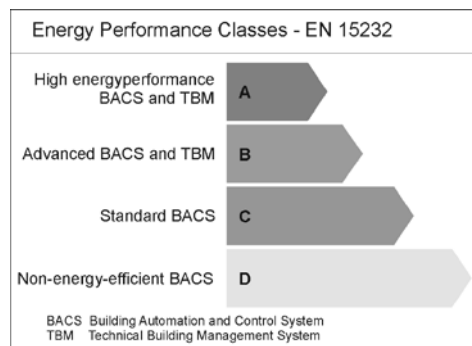
The applications are tested under real conditions for control accuracy and energy efficiency. Using energy-optimum Desigo applications, building operating costs are cut in a sustainable way, energy resources are preserved and CO2 emissions lowered.



Energy efficiency

The standardized and tested functions conform to the European standard EN 15232 (Energy Efficiency in Buildings – Influence of Building Automation and Control and Building Management) in the highest categories. Using the existing energy efficiency applications, the environment is protected sustainably and building operating costs are lowered through the entire life-cycle of the building.

Thanks to eu.bac-certified applications for the Desigo TRA and RX room automation product ranges, Desigo ensures top energy efficiency.



Security and quality

The application reflects decades of Siemens experience. A number of software applications were developed and extensively tested in real plants to maximize the security and quality of the solutions.

The application portfolio guarantees a high degree of protection for your investment.

Ease of use

All applications were developed with a focus on maximum ease of use. With their sophisticated control strategies and concepts, the applications offer an optimum balance between convenience and energy usage.

Operation and monitoring

All applications are subject to a transparent operating concept to keep training costs to a minimum. This ease of operation is provided to the customer throughout the Desigo system, and is used primarily when combining plants.

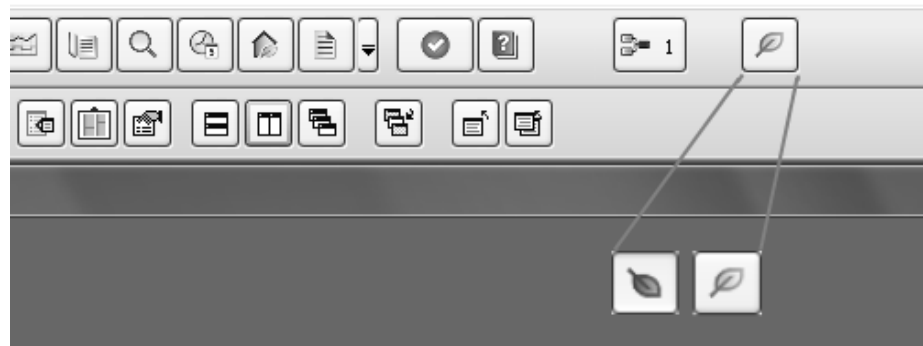
Siemens always pays special attention to ease of operation should operator interventions be required on the Desigo Insight management station or touch panel PXM40/PXM50 or operator units on the panel using the PXM10/PXM20. Thanks to its consistent operating concept, users are able to quickly initiate the proper action – even in hectic situations.

Flexibility

Desigo applications map real plants and are clearly structured. Several components form an aggregate, and several aggregates form a complete plant. Changes to the structures can be made in a flexible manner during a project's engineering phase. Desigo applications thus fit into the overall extendable modular system, ensuring long-term cost-effectiveness.

Eco Monitoring – managing energy in terms of demand and extending plant life

The Desigo application libraries contain partner compounds for the Eco Monitoring function. Plant operators benefit from continuous monitoring of process and consumption values. The Desigo Eco Monitoring system function provides a decision-making basis for economical plant operation. Based on reference data, Desigo Eco Viewer shows the efficiency of primary plants in real time (baseline comparison). SMS, fax, or e-mails inform on uncommon events as needed. This allows for introducing short-term measures to restore economic plant operation, thus avoiding unnecessary energy consumption and plant wear and tear. The Web functionality allows for quickly identifying and resolving energy-related errors via remote control.



Green Leaf indication on the Desigo Insight task bar

RoomOptiControl – saving energy in the room without compromising comfort

Desigo Total Room Automation (TRA) allows room users to actively manage energy in a building via the QMX3 or QMX7.E38 room operator units.

The RoomOptiControl energy efficiency function detects unnecessary energy consumption and indicates it on the room operator unit via the Green Leaf symbol.

When the Green Leaf symbol is green, the system is energy-optimized. If it is red, energy can be saved, e.g. when the blinds are closed or the lighting is on.

When pressing the Green Leaf symbol, room control returns to energy-optimized operation. This allows users to avoid unnecessary energy consumption without requiring expert knowledge.

Important: The intelligent RoomOptiControl function ensures energy-optimized operation without loss of comfort (good air quality, comfortable temperature, and optimal lighting).

Desigo TRA thus closes a gap in overall energy optimization of buildings.



Comprehensive Desigo application libraries

The comprehensive Desigo application libraries meet individual customer demands by offering maximum user convenience at highest building efficiency.

Application examples of primary plants:

- Modular HVAC applications
- AirOptiControl for energy-optimized air volume flow
- tx2 Economizer for energy-optimized air conditioning plant control
- TABS control with unique concrete core activation control
- Innovative predictive heating controller
- Heat storage for solar energy to increase energy efficiency
- Solar energy to heat water
- Solar position identification to save energy in the building
- Quick and easy display of energy-related information

Examples of programmable, integrated room solutions and applications:

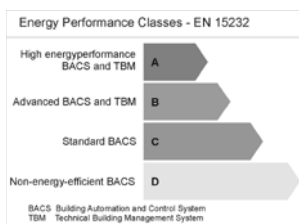
- Preconfigured room solutions for various room types
- Comprehensive comfort, energy optimization, occupancy, and central functions
- HVAC applications for radiators, chilled ceilings, volume flow control and fan coils
- Air quality applications
- Lighting applications for switched and dimmed lighting plus constant lighting control
- Shading applications with anti-glare protection, solar position tracking, adaptive control, collision detection, and facade control
- Option to set up, change, and store scenes across all disciplines from the system to the room level
- Central functions such as scheduler programs, alarms and commands

Optimum evaluation for building certification

Building certification means a building is environmentally-friendly, sustainable and economic. Prior to and during building construction, experts can assess the building based on criteria and early on identify weak spots. Building efficiency thus is an ideal planning aid and is proof of sound quality and sustainability. Desigo improves and optimizes evaluation of many criteria, representing a prerequisite for buildings with highest certification levels thanks to its high total system functionality.

There are different evaluation procedures for buildings worldwide. The U.S. LEED (Leadership in Energy and Environmental Design) is the most common certification along with BREEAM (Bre's Environmental Assessment Method) from the United Kingdom. In Germany, DGNB (Deutsches Gütesiegel Nachhaltiges Bauen) includes the entire life-cycle. In addition, Europe also knows the EU Green Building Program. Although all certification procedures evaluate different criteria, most of them apply the same common features from energy to water savings, materials, health, and comfort.

A decisive part of building certification (which specifies achievable quality levels) is energy-efficient building automation and control. Comprehensive, BACnet-based systems such as Desigo have many advantages over proprietary systems. The vendor-independent and open BACnet standard allows for integration of environmentally-friendly technologies, paving the way for future, energy-efficient strategies.



The Desigo system provides a host of options to control, operate, monitor and optimize building systems. Including solar position and weather forecasts as well as optimized control strategies in building management ensures that energy consumption is reduced while room comfort is increased. An advanced operating concept enables room users to choose between comfort and energy efficiency modes as well as change control strategies with no need for expert knowledge. Integrated room automation with Desigo featuring lighting and shading (blinds) control facilitates control across all disciplines, aimed at achieving energy performance class A as per EN 15232.



Desigo's comprehensive system functionality serves as the basis for eu.bac system certification. Also, a number of Desigo room automation products include eu.bac product certification. The combination of both certifications ensures that systems and products meet the specified properties and quality to achieve the best possible energy efficiency in the building.

Energy management

Software package for energy-efficient building operation

Facilities management today places prime emphasis on user comfort and the minimization of operating costs. To meet demands in both these areas satisfactorily, additional analysis software packages are required, which build upon the existing BACS.

For efficient and economical facilities management, Siemens offers you the right solutions: CC (Consumption Control) for energy management and ADP (Advanced Data Processing) for financial management of the plant. The applications will fit seamlessly into your system topology and assist you in the running of your building(s) in an energy-efficient manner.

Supplementing these two packages, EMC (Energy Monitoring and Controlling) – an innovative Web-based software solution – is also available.

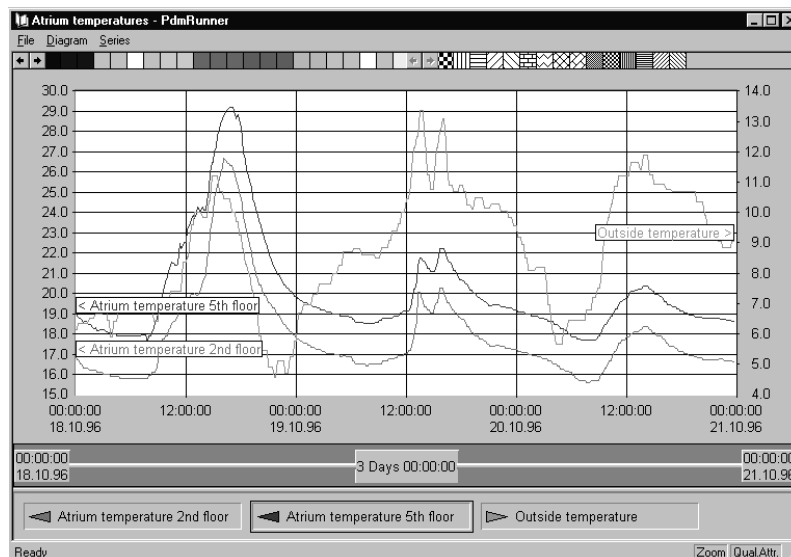
Technical plant control – ADP



The ADP software application analyses the building's plant data (measured values, manipulated variables, messages, etc.) and collates these data to produce meaningful reports. Any relevant data point from BACS can be logged for analysis purposes. Based on these data, further measures for optimization of the plant can be undertaken and monitored.

Analysis of plant data from the building:

- Analysis of ambient conditions
- Identification of optimization potential
- Analysis of processes in BACS
- Verification of building automation process



Plant data report

Example: Identifying optimization potential

Many optimization measures and resulting cost savings can be implemented quite easily, provided the potential for optimization has been identified. For example, when ADP controls loads for given user groups over a certain period of time, it is easy to establish where savings through plan adaptation are possible.

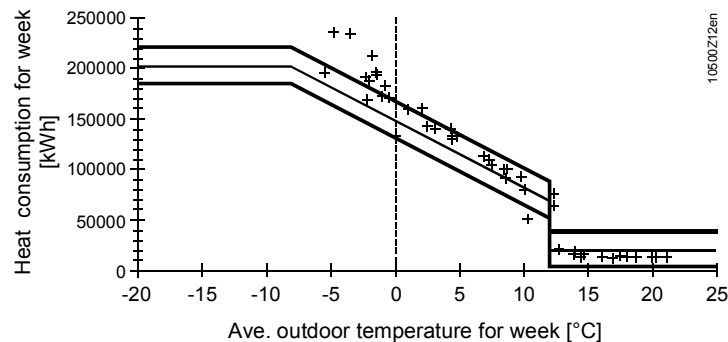
Consumption and energy management – Consumption Control CC



The CC software application produces meaningful reports from meter values. CC shows where there is need to act, and where it is worth investing money in measures to save energy. As a comprehensive tool for monitoring and financial control of energy consumption, CC makes energy consumption transparently clear and highlights problem areas. It also lets you distribute costs and consumption values to cost centers, facilities, profit centers, etc.

Energy management

- Monitoring energy consuming equipment
- Identification of potential savings
- Calculation of consumption costs
- Control of emissions



Example: Energy signature

Energy-saving measures can be successfully implemented only if it is clear where there is a need for action. The energy signature of a building is an effective tool for highlighting problem areas in a building or faults in the building systems. This energy report shows the relationship between the weekly consumption of heating energy and the weekly average outside temperature. In the example, deviations from the defined setpoint area point to infiltration problems ("leaky" building).

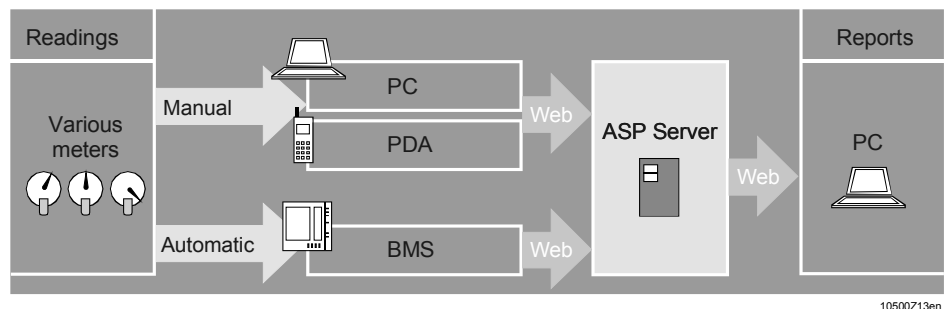
EMC: Energy Monitoring & Controlling (eAdvantage)

As Siemens' first e-service solution, EMC offers you a comprehensive application for Web-based energy management.

The EMC service module will help you ...

- monitor and check your energy and building running costs,
- identify potential areas for optimization,
- improve quality and performance in the running of your building.

Based directly on the consumption data you enter, you will receive regular, informative reports on the consumption of energy and media, and on emissions.



EMC: Energy Monitoring & Controlling

10500Z13en

Pharma Solution

Integrated regulatory compliance for Desigo Insight

The Desigo Insight Pharma Solution meets the extremely demanding requirements found within the tightly regulated Life Science Industry.

The application offers advanced technical solutions for customers with high requirements for IT integration, availability and long-term data security.

Pharma Solution benefits and features

- An audit trail at the database level for GxP critical data prevents unauthorized attempts to make changes to data in the audit trail, log, trend, and system data bases
- The "Viewer" application is used to search for data within the audit trail, to create reports from the data or backup archive files
- Standard report templates can be created as temporary reports in addition to planned reports
- In the event of a system failure, the hourly backup copies of all database transaction logs and daily comprehensive database backups significantly reduce the potential for data loss
- User actions must be justified with a reason (or comment) before the action is carried out. Multiple comments for the same action (or log entry) are possible. Fixed text numbers can no longer be released
- A complex MD5 checksum for each archived file ensures the integrity of all archived data. The option to secure the readability of archived files throughout the entire data lock out period is guaranteed through the use of XML as a storage format
- User administration is simplified through the use of integrated Windows confirmation (linking the Windows user to the Desigo Insight user)

Extension of Desigo for the Pharma Solution



Audit Viewer



Standard report templates



Comments for user actions related to Desigo PX (PXC...D)



Data integrity using checksum verification

Archived data integrity using checksum verification

The Desigo Insight archive server generates a complex MD5 checksum for each produced archive file. All viewers that want to display the data from archives are asked to verify the checksum as soon as the archive files are opened. The verification results are displayed to the user.

All GxP-critical data from the Desigo Insight log, trend and audit trail databases can either be archived in non-proprietary readable XML format or secured using the MD5 checksum. The data archived in XML format can then be viewed as a standard in Desigo Insight applications such as Trend Viewer, Log Viewer or Database Audit Trail Viewer.

InfoCenter

InfoCenter prepares documented evidence of room conditions for the Life Science Industry and retains this information over decades.

GxP-compliant monitoring and reporting

The InfoCenter integrated report manager allows users to generate individual report templates quickly and simply. In addition to data from the subordinate automation system, statistical analyses, system messages and deviations from limits can be displayed in the form of graphs and tables. A detailed "Out of Specification Report" can be created at the touch of a button, a report which reflects only the deviations from the specified limits. The extensive calculating features ensure that even complex calculations can be performed, ranging from averaging to calculating the mean kinetic temperature (MKT).

The reports created by InfoCenter can be signed with an electronic authentication, which makes them a fully valid substitute for conventional paper documents.

Protected Web access to the InfoCenter server ensures that individual users obtain the exact information that they need. Reports can be launched remotely and, for example, analyzed by the audit trail software.

Data security

InfoCenter was designed specifically for large volumes of data, and is based on the strength and flexibility of the Microsoft SQL server. Access to the data is protected by a wide range of security measures, and all changes are reliably recorded in the integrated Audit Trail software.

Reliable archiving of data

Sensitive data and reports are archived in InfoCenter automatically, safely and reliably. The retrieval of archives, e.g. for inspection purposes, is also automatic. The system independently recognizes periods distributed over several archiving disks in this process.

Technical solutions for 21 CFR Part 11

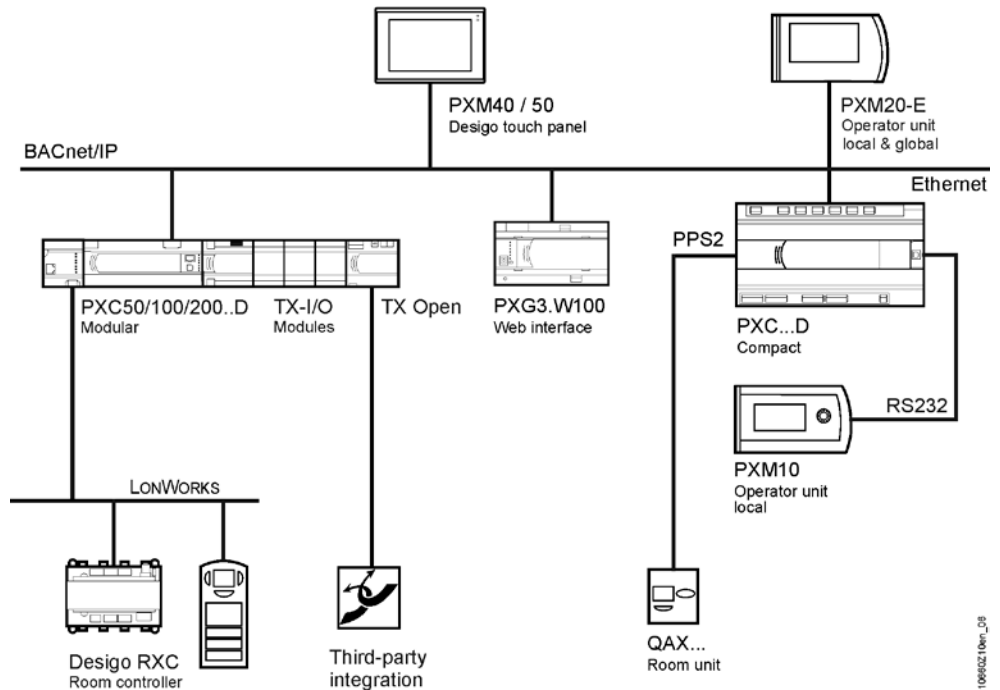
InfoCenter provides consistent support for the security functions defined in 21 CFR Part 11, including data security, access protection, audit trail, backup and archiving.

Siemens provides consistent support for the compliance process in the Life Science Industry with wide-ranging validation services and extensive training for users through the modular training program.

System topologies

System design for small buildings

A smaller automation system can be implemented with just a few PX automation stations in modular or compact form. The automation stations can be extended with optional touch panels PXM40/PXM50, plant/network operator units PXM10/20 or the room operator units QAX....



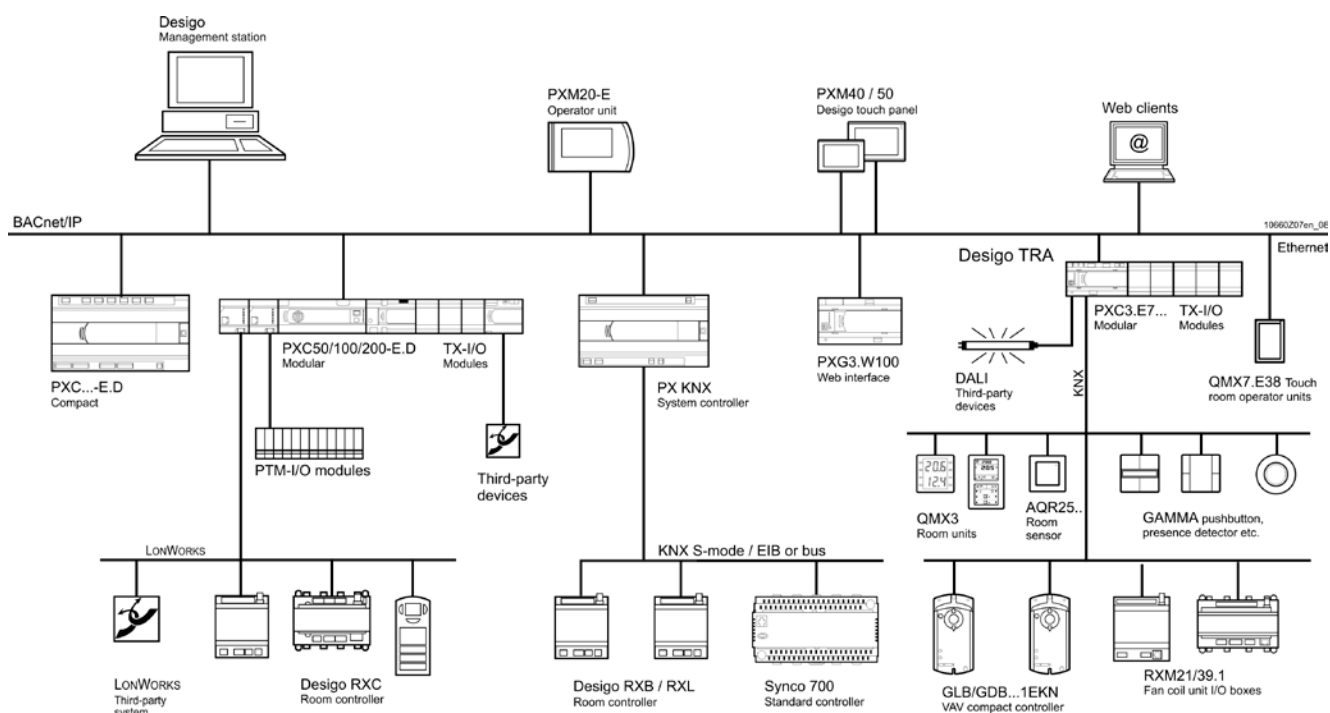
Topology for small buildings

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System design for small to medium-size buildings

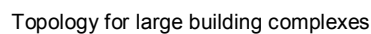
Several PXC automation stations are connected via BACnet/LonTalk or BACnet/IP to the PXC3 room automation stations or RX room controllers. Depending on plant size, the Designo touch panels PXM40/PXM50 or Designo Insight management stations can operate and monitor the automation station. Operation can take place via the networkable operator units PXM20. QMX3 room operator units operate the PXC3 room automation stations.

You can extend the system to Web operation for remote operation by Designo Touch and Web for tablets, notebooks/PCs or smartphones. Thanks to this Web operation, the building user has access to the entire range of functionality on the Designo touch panel PXM40/PXM50 at all times and regardless of location. PX Web ensures alarming per SMS or e-mail in the event of fault.



Topology for medium size buildings

For remote access, connections via Ethernet, LAN, W-LAN or modem are possible. The Desigo Insight management station and Web operation of Desigo Touch and Web permit connection from any location to the in-house LAN.



Desigo – an innovative system for all demands

Saving energy and achieving highest efficiency classes

Using tested applications as well as energy saving and monitoring functions on all system levels, Desigo allows you to permanently lower your energy costs without sacrificing room comfort. Another way to save energy is to actively involve room users in the room automation process, as demonstrated at the ThyssenKrupp headquarters.

Maximum flexibility for long-term investment protection

If your building's usage changes or if you need to modify the room layout, Desigo can be flexibly adapted to the new situation. Open communication standards offer cost-effective integration capabilities for any building requirement – and you benefit from maximum IT compatibility. In addition, Desigo meets international BACnet standards and AMEV¹⁾ recommendations.

Superior comfort for maximum performance

An optimized room climate has a positive effect on room users, whether it is better motivation, improved concentration or higher performance. Desigo makes it particularly easy to achieve the ideal room climate using system-wide intelligent control strategies as well the Green Leaf symbol with its uniform operating and monitoring concepts.

Significant productivity and efficiency gains

Desigo permanently lowers your operating costs, promotes a positive image for building operators and increases the value of the building. One reason are the infrequent maintenance intervals which do not affect your operations and productivity. In addition, the system delivers everything you need to meet the highest building certification levels in accordance with LEED²⁾, DGNB³⁾ or BREEAM⁴⁾.

Easy installation, easy maintenance

Desigo makes installation and commissioning quick and easy. Standardized engineering greatly reduces the maintenance effort. Intuitive room operator units can be mounted in minutes. In addition, an extensive library of tested applications improves reliability and facilitates commissioning and maintenance.

Reliability across the entire life cycle

Desigo delivers the reliability of a system that has proven itself in many installations. All components are tested by independent certification authorities and offer measurable reliability from the automation to the management level.

Highlights

- Lower energy costs resulting from intelligent energy management and energy saving functions
- Long-term investment protection due to maximum flexibility
- Optimized room climate enhancing user productivity
- Higher efficiency with lower maintenance effort
- Convenient handling in each phase
- Certified reliability and longevity

¹⁾ AMEV: Arbeitskreis Maschinen- und Elektrotechnik staatlicher und kommunaler Verwaltungen (Mechanical and Electrical Engineering Working Party of National, Regional and Local Authorities – Germany)

²⁾ LEED: Leadership in Energy and Environmental Design (USA)

³⁾ DGNB: Deutsches Gütesiegel Nachhaltiges Bauen (German Sustainable Building Certification – Germany)

⁴⁾ BREEAM: Bre's Environmental Assessment Method (UK)



Tested quality

BACnet® Testing Laboratories (BTL) is a registered trademark. Products that were successfully tested by BACnet Testing Laboratories are allowed to carry the BTL trademark.



ThyssenKrupp headquarters, GER

The approximately 2,000 employees working at the ThyssenKrupp corporate headquarters enjoy a comfortable workplace climate. A special Desigo operating concept allows each employee to individually set the climate, lighting and shading controls, thus helping lower the company's energy costs.

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The information in this document contains general descriptions of technical options available, which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.

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Answers for infrastructure and cities.

Our world is undergoing changes that force us to think in new ways: demographic change, urbanization, global warming and resource shortages. Maximum efficiency has top priority – and not only where energy is concerned. In addition, we need to increase comfort for the well-being of users. Also, our need for safety and security is constantly growing. For our customers, success is defined by how well they manage these challenges. Siemens has the answers.

“We are the trusted technology partner for energy-efficient, safe and secure buildings and infrastructure.”